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Smithsonian

JANUARY 2009

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A daredevil photographer's astonishing views

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SAMARRA: LOOKING UP
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OWL VS. OWL
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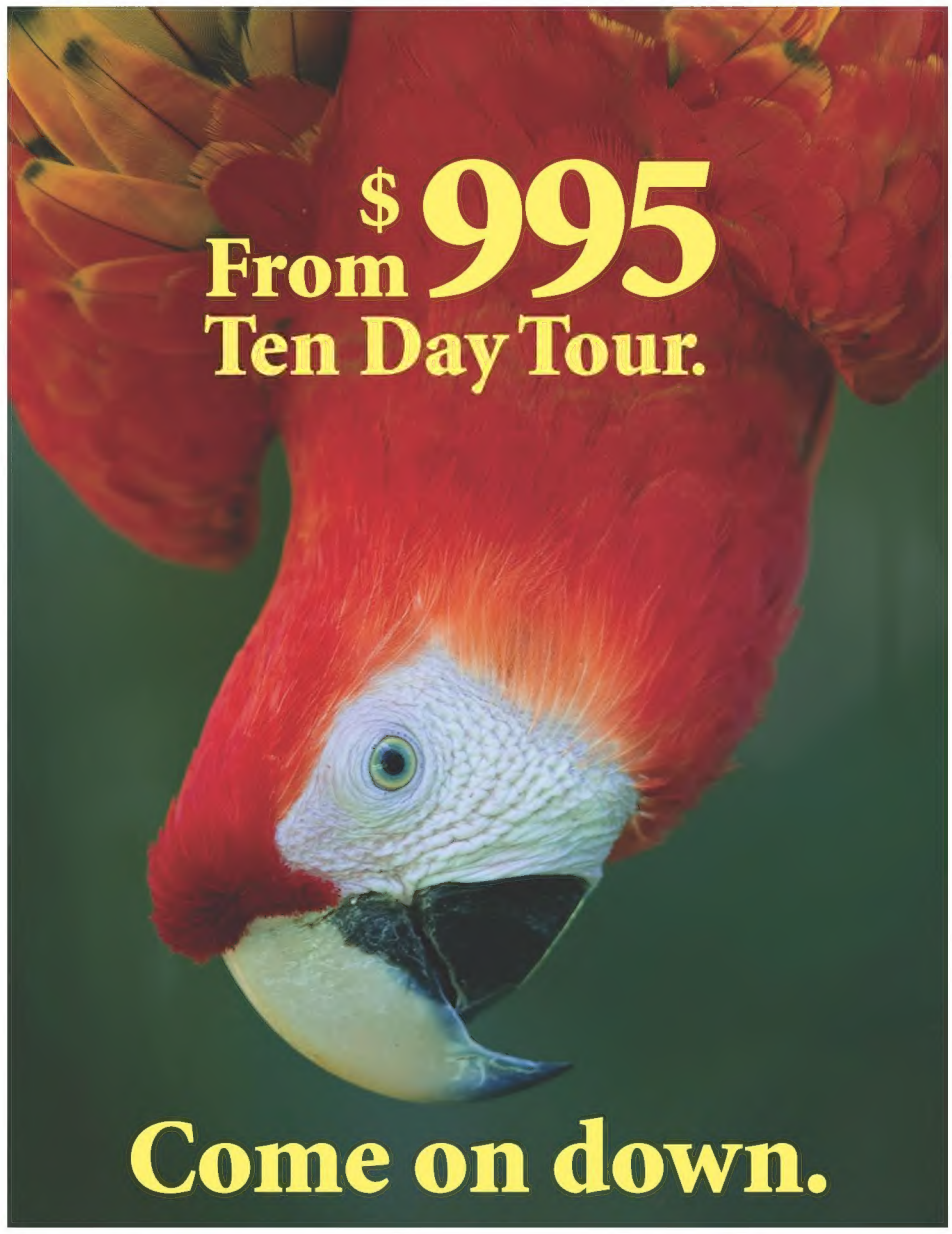

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CANADA

Smithsonian features

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A month earlier, researchers injected Bacoccini's right eye—the worse one—with billions of working copies of the retinal cell gene. Now they'd find out if the treatment worked.

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PAGE 54

ON THE COVER Paragliding photographer George Steinmetz flies over a herd of elephants in Kenya's Lake Amboseli.

PHOTOGRAPH BY ALEXIS PELTIER

THIS PAGE Twenty-year-old Alisha Bacoccini undergoes a test of her peripheral vision as part of a gene-therapy clinical trial in Philadelphia.

PHOTOGRAPH BY STEPHEN VOSS / WPN

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Two years after Al Qaeda in Iraq blew up a sacred Shiite shrine, unleashing a wave of sectarian violence, Sunnis and Shiites have joined forces to rebuild the mosque—and the war-ravaged city

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Abraham Lincoln ascended to the presidency with only negligible military experience. But his natural intelligence turned him into a more strategic general than his generals **BY JAMES M. MCPHERSON**

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Motoring over Africa in his flying machine, photographer George Steinmetz risks it all for art

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An experimental treatment for a rare, inherited form of blindness offers hope not only for patients but also for a troubled field of medicine

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The poster bird of the environmental movement is again under attack—this time from one of its own

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We may think of van Gogh as a man obsessed with light: yellow wheat fields, cobalt skies. But he was no less enthralled with the colors of the night

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74 Mining the Mountains

As residents of Ansted, West Virginia, witness the destruction of their town's signature peak, critics decry an all-too-efficient form of extracting coal

BY JOHN MCQUAID

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"Group shots are endlessly fascinating because they bring out something in subjects rarely found in individual portraits."

"THE MORE THE MERRIER"
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Members of the Marina Women's Bowling Club of Eastbourne, Sussex, England, show their colors to Neal Slavin in 1984.
PHOTOGRAPH BY NEAL SLAVIN

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FROM THE EDITOR

Elevations

Disparate views from on high

BY CAREY WINFREY

CRAIG WELCH, who covers the environment for the *Seattle Times*, says once we start playing "with the tapestry of Mother Nature, we never know exactly what's going to happen." That's the theme of his piece ("The Spotted Owl's New Nemesis," p. 62) about the endangered bird that became a cause célèbre two decades ago when environmentalists rallied to block logging in its old-growth forest habitat. But now it faces a new threat—another, bigger owl moving into its territory. Some experts recommend killing some of the invaders. "I was surprised by the whole idea that you would go out and arm people to try to protect one bird from another," says Welch. "On the face of it, it seems ridiculous. . . . It's almost a perfect metaphor for how complicated playing around with nature really is."

WHEN STAFF WRITER Abigail Tucker visited George Steinmetz at his New Jersey home, the photographer strapped on his flying machine—a motorized paraglider—and an assistant gave the cord a yank. "It's almost exactly like starting a lawn mower," Tucker says. Later, at an airfield, Steinmetz "went up into the sky very, very quickly. It's nerve-racking to think that he does this in extremely remote places, where if something happened it would take time not only to find him but to get him to a doctor. He's had some catastrophic spills. But I think the fact that he risks his life testifies to his vision as an artist. He loves what he does and he loves the look of the world from up there." ("Winging It," p. 46.)

Steinmetz takes off in Niger

GEORGE STEINMETZ

MOUNTAINTOP COAL REMOVAL, a ruthlessly efficient process by which entire peaks are leveled, struck freelance journalist John McQuaid as "a good way to get into some of the issues driving the discussion about energy right now." The setting for his story ("Mining the Mountains," p. 74) is Ansted, West Virginia, where environmentalists and coal interests are engaged in a face-off with far-reaching implications: about half of the nation's electricity comes from burning coal, and more and more of it is extracted from mountaintops. "In West Virginia the sides are both so entrenched and coal is so tied to the power structure that it's very hard to find some alternative to it or to moderate the practices," says McQuaid, a Pulitzer Prize-winning former investigative reporter at the New Orleans *Times-Picayune*. "The coal association doesn't brook any criticism from environmentalists, and the environmentalists can do nothing but yell and scream. It's disconcerting. As Americans, we like to be able to hammer things out if possible. That just doesn't seem to be an option in this situation."

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LETTERS READERS RESPOND TO THE **NOVEMBER** ISSUE

Oh, that we could say today what Harold Holzer said of Lincoln's first election to the presidency ("Election Day 1860"): that it was a "bitter, raucous, six-month-long campaign." Only six months? For that short a campaign, we might even welcome a cannon salvo at sunrise, like the one that rang out in Springfield, Illinois, in 1860.

SHARON ROGERS, BAKERSFIELD, CALIFORNIA

LINCOLN'S SECOND VICTORY

"ELECTION DAY 1860" provides excellent insight into the mood and circumstances surrounding Abraham Lincoln as the returns came in and he finally realized that he had been elected. But the election of 1864 is of equal fascination and gravity, for Lincoln could have been defeated, leaving the fate of the nation in peril. All the confidence of those opening days of war vanished as weeks turned to months and months turned to years and still the fighting raged. The famous editor of the New York *Tribune*, Horace Greeley, a fiery hawk as the war began, was now crying for peace with the South along with a growing number of advocates of reconciliation. Recall that in the months before the 1864 election, Grant's army suffered ghastly losses; at Cold Harbor in Virginia alone, 7,000 Union soldiers were shot down in under 30 minutes. In that light, it seems miraculous that Lincoln managed to win (re-election and the war) and change the course of history.

LOUIS C. KLEBER
LAS VEGAS, NEVADA

MISSING SOLDIER

ON REACHING the end of your informative article about John Rich's color photographs ["One Man's Korean War"], I was disappointed that you didn't include the picture of a "South Korean soldier with pink flowers lashed to his helmet," as author Abigail Tucker described in her last paragraph. "The young man must have wanted to be seen. And now, finally, he is." Although Tucker did a lovely job of communicating the image in words, you left us readers in the lurch.

JOHN L. AURBAKKEN
KIGALI, RWANDA

We're happy to help you (and other readers) out of the lurch. Here's the photograph in question.—Ed.

WHAT A COUNTRY

WHEN I VISITED the National Museum of American History a few years ago, what stopped me dead in my tracks was the Greensboro, North Carolina, Lunch Counter ["From the Castle: History Ahead"], site of the 1960 desegregation sit-in. What kind of country, I asked myself, anchors an exhibit in its national museum with a lunch counter? A special kind of nation, I decided. Thanks to the Smithsonian for all it does to help us remember who we were, and are.

HERB LEVINE
LAKEWOOD, WASHINGTON

MOTORCYCLE PARTS

PERHAPS in the 1950s, motorcycling meant defiance ["Curious Perspective"], but for America's early black aviators of the 1920s and '30s motorcycles were an affordable means of transportation and even a source of airplane engine parts. My great-uncle, James Herman Banning, rode motorcycles and used automobile and motorcycle engine parts to build and repair airplane engines. On the last leg of his pioneering voyage in 1932—he was the first African-American to fly cross-country—he dropped campaign fliers for the Roosevelt presidential ticket in exchange for funding to get back home.

PHILIP S. HART
LOS ANGELES, CALIFORNIA

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JOHN RICH

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WILD THINGS

LIFE AS WE KNOW IT

BY AMANDA BENSEN, T.A. FRAIL, MEGAN GAMBINO, ANIKA GUPTA, ABIGAIL TUCKER

THE DEPTHS OF EVOLUTION

Researchers studying the origins of deep-sea animals analyzed the family tree of octopuses that live in total darkness. The eight-legged creatures evolved from a common ancestor that lived 34 million years ago in the Southern Ocean. Its closest living relative is the yard-long *Megaleledone setebos* (left: a juvenile), which still lives in Antarctica. Other species were carried to new habitats on deep-sea currents called the "thermohaline expressway."

WATER, WATER, EVERYWHERE

It was "long-standing dogma" that sea snakes subsist on saltwater, say researchers from the University of Florida and elsewhere. But when they tested venomous kraits in the lab, the snakes drank only freshwater or highly diluted saltwater. Conclusion: the sea-dwelling reptiles must drink river or spring water that flows into the ocean or rainwater that pools on the sea surface.

THE CLICK OF THE WILD

Eland antelopes use their knees to get a leg up on rivals, according to researchers working in Kenya. When mature bulls walk, their knee tendons slip over their leg bones, making a clicking sound like castanets. The noise, which can be heard hundreds of yards away, may help maintain dominance hierarchies: the louder the tone, the bigger the bull. The downside? Lions can hear it, too.

Watch and listen as an eland's knees click at Smithsonian.com/WildThings

AERIAL MANEUVERS

Why do butterflies have two sets of wings? Not to stay aloft, it turns out. Scientists from Carnegie Mellon and Cornell found that cabbage white butterflies with their hindwings removed could fly as far and as high as before. But they were slower to turn. This suggests hindwings are the key to aerial agility, a trait that helps butterflies evade hungry birds.

Observed

NAME: *Catharus ustulatus*, or Swainson's thrush.
SUMMERS: In Canada and the northern United States.
WINTERS: In Mexico and South America.
FLIES: By night, at least when migrating.
SLEEPS: Surreptitiously. Scientists have long wondered how migrating birds, after flying all night, apparently make it through the day without sleeping. A new study of brain waves among captive Swainson's thrushes suggests they drowse with their eyes open; nap for mere seconds; and doze with one eye open, resting one side of their brain at a time. They could be catnapping while watching out for the cat.

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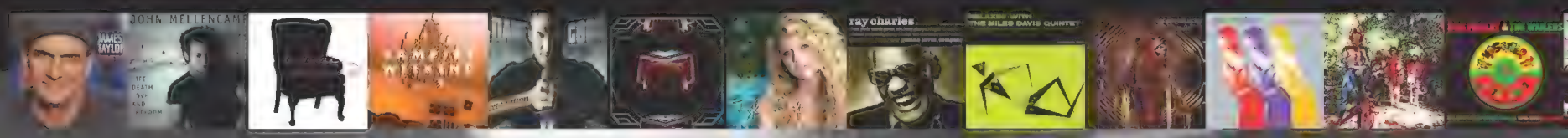

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The More the Merrier

Neal Slavin captures the night some Santas bent the rules **BY DAVID ZAX**

'TWAS THE SEASON, and photographer Neal Slavin was racking his brain for a holiday picture. This was 1987, and Slavin had been doing a series of group portraits for the *Washington Post Magazine*. "I got to thinking," he says. "What happens while Santa isn't working?"

After rejecting a few ideas (among them, 20 figure-skating Santas), it occurred to Slavin that what Santa might most want to do after work was have a snack. "I figured he'd go in and have a hot toddy or something," he says. So he sat seven Santas around two tables at the Tastee Diner in Silver Spring, Maryland, and served up some milk and cookies.

The *Post Magazine* group portraits were an extension of the work that has defined Slavin's career. In the early 1970s, the photographer, now 67, was helping a friend research a film about the '50s when he came across an old group photograph of a Boy Scout troop. He had studied Renaissance art on a summer scholarship at Oxford University and was making a name for himself as an art photographer, yet he felt strangely moved by this bit of Americana.

"I just got so intrigued with it—it took me by surprise," Slavin says. Group shots, in his view, are endlessly fascinating because they bring out something in subjects rarely found in individual portraits: "You discover people are showing their public faces," he says. Your eye goes from figure to figure as you try to discern how the presence of one affects the behavior of another.

NEAL SLAVIN

"Very seldom do a bunch of Santas get together," says Clarke (below, at right), who manages apartments by day.

"I'm still fascinated by who these guys are," Slavin says. "How much did they reveal of themselves?"

Levick (above left, with Clarke in 2008) has 39 years in the Santa game. Slavin (below) says his group portrait work "gets deeper and deeper."

Within days of seeing the Boy Scout picture, Slavin took his first group portrait, of the Flushing Volunteer Ambulance Corps in Queens, New York. In short order, he embarked on what he calls "an odyssey across America," photographing groups. The resulting book, *When Two or More Are Gathered Together* (1976), is like a snapshot of the nation: on one page, a bingo club is poised to play a round in St. Petersburg, Florida; on another, the crewmen of the SS *Skate* stand in neat rows atop their nuclear attack submarine at port in Groton, Connecticut; on yet another, 33 boys show off their waistlines at a weight-loss camp in Loch Sheldrake, New York. The book seems heir to all sorts of visual traditions, from Leonardo da Vinci's *Last Supper* to August Sander's photographic portraits of the people of Weimar Germany to the Boy Scout picture from which Slavin fatefully blew the dust.

After his book was published, the photographer thought he would move on. No such luck. "No matter what I do, these group portraits keep coming back," he says. His 1986 book, *Britons*, examined similar groups in the United Kingdom, and he is now planning a project on religious groups in America. "The subject doesn't stop," he says. "It gets deeper and deeper."

Only rarely does Slavin get in touch with his group subjects again, but he often wonders about them. Examining the Santas, he tries to read their poses—their postures, their gazes, the manner in which they hold their cookies. "I'm still fascinated by who these guys are," he says. "How much did they reveal of themselves while they were posing for that picture?"

Slavin's Santas were the cream of the crop. Today, Leslie Collins, who waves from the center of the picture, draws a firm distinction between the men in Slavin's photograph, who commanded $100 to $250 an hour for private or corporate events, and the run-of-the-mall variety that he calls "pee-on-the-knee Santas." Collins, now 72, offers a take on Santa personification that echoes Slavin's on group portraits: it's all about revealing part of yourself as you inhabit a well-known role. "When you are a Santa, you're trying to be the character—but in your own way," he says. "I don't say 'Ho ho ho,' ever. There are just certain lines you stay away from."

Michael Levick, to the immediate right of Collins in Slavin's photograph, donned his first Santa suit at age 16—39 years ago—assuring skeptics that "to children, anyone older than them is old." He is the only Santa in the picture without eyewear. "Les [Collins] always said, 'Why don't you wear glasses?' And I said, 'I'm not reading notes—I'm visiting people!'" Levick points out Santas used to be portrayed wearing glasses only when reading letters sent to the North Pole.

"It's hard work," Collins says of being Santa, and so the Slavin shoot, which simply involved showing up and posing with some buddies, was a piece of fruitcake. A rarity, too, since professional code dictates that Santas avoid each other for fear of confusing children. Says Jerry Clarke, 53, the rightmost Santa daintily dunking his cookie: "Very seldom do a bunch of Santas get together."

DAVID ZAX *is a freelance writer in Washington, D.C. He wrote about photographer Emmet Gowin in December 2007.*

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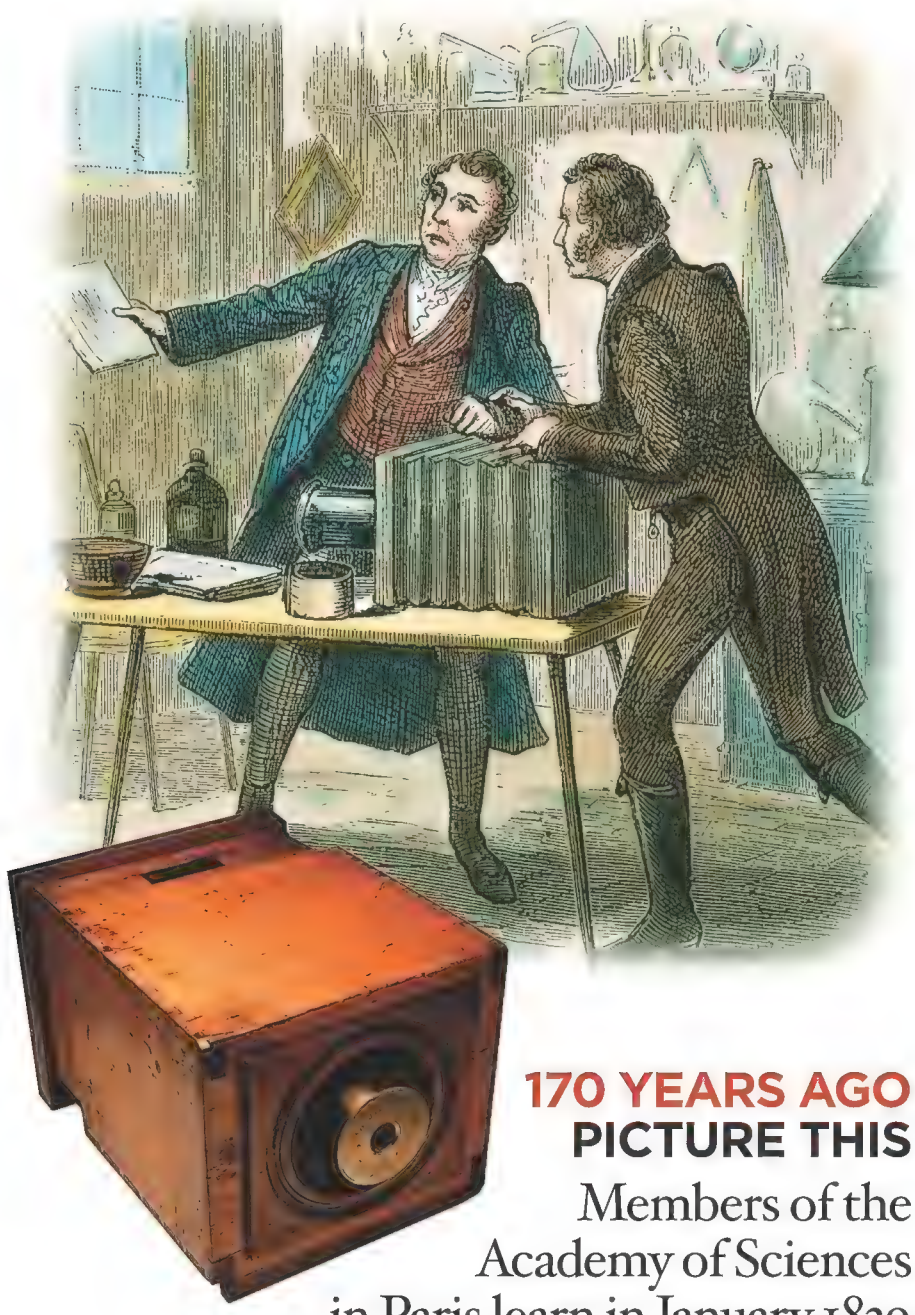
BY ALISON McLEAN



170 YEARS AGO PICTURE THIS

Members of the Academy of Sciences in Paris learn in January 1839 of Louis-Jacques-Mandé Daguerre's pioneering photographic process. It's the first method to achieve widespread success—Daguerre's light-sensitive copper sheets reduce exposure time from hours to minutes—and before it is supplanted in the 1850s, millions of daguerreotypes are taken annually. Daguerre dies, at 63, in 1851.

250 YEARS AGO AULD ACQUAINTANCE REMEMBERED

Scottish poet Robert Burns is born January 25, 1759, in his father's farm cottage in Alloway. He tries farming, but concluding that "the best-laid schemes o' mice an' men" often go awry, turns to poetry. His 1786 book of poems, written in Scottish dialect, charms Edinburgh society, though it brings Burns more fame than fortune. He also collects, writes and rewrites hundreds of Scottish songs, and his *A Man's a Man for a' That* and his version of *Auld Lang Syne* are staples at New Year's Eve parties and Burns suppers centuries after his death, at 37, in 1796.

50 YEARS AGO CASTRO SEIZES POWER

Revolutionary forces led by Fidel Castro, 32, overthrow the government of Cuban dictator Fulgencio Batista, January 1, 1959, five and a half years after the 1953 attack on a military barracks that gives Castro's guerrilla 26th of July Movement its name. Batista flees Cuba, and Castro, who had declared himself "not interested in power," takes control of the Cuban government in February. He cuts ties to the United States, nationalizes private land, commerce and industry, embraces Communism and violently suppresses opposition. In February 2008, an ailing Castro passes leadership of the island nation to his brother, Raúl.

450 YEARS AGO AS SHE LIKED IT

Elizabeth Tudor is crowned Queen of England in Westminster Abbey on January 15, 1559, in the kind of "pompous ceremony" she deems a secret of good government. After parading four miles through London, courting the crowd and viewing pageants in her honor, she receives the Imperial Crown—which, at seven pounds, is too heavy for her and is replaced with another. She ably assumes the burdens of monarchy, however, restoring Protestantism to England, keeping Spain and France at bay, and lending her name to an age of literary flowering that ends with her death, at 69, in 1603.

40 YEARS AGO LETTING IT BE

The Beatles give a surprise performance—their last public concert together—on the roof of Apple Records' London recording studio, January 30, 1969. Paul McCartney, John Lennon, George Harrison and Ringo Starr, already beginning to go their separate ways but hoping to recapture the band's energy, film themselves—until police say "hello goodbye"—playing several songs from a new project. The album and film, reworked into *Let It Be*, record the tensions leading to the group's breakup in 1970. John Lennon is killed in 1980, but the three remaining Beatles reunite to record two songs in 1994. George Harrison dies in 2001.

MICHAEL NICHOLSON / CORBIS; GRANGER COLLECTION, NEW YORK; BOB HENRIQUES / MAGNUM PHOTOS; MICHAEL FREEMAN / CORBIS (CAMERA); THE GALLERY COLLECTION / CORBIS; EVERETT COLLECTION

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Around the Mall

SCENES AND SIGHTINGS FROM THE SMITHSONIAN MUSEUMS AND BEYOND

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Harrison: "Practically every product in the Sears, Roebuck line I had a hand in at one time or another."

VIEW MASTER

THE SMITHSONIAN'S COOPER-HEWITT HONORS INDUSTRIAL DESIGNER CHARLES HARRISON WITH ITS LIFETIME ACHIEVEMENT AWARD

PAGE 22

TIM KLEIN

FROM THE CASTLE

Teaming Up

G. WAYNE CLOUGH

THERE IS HOPE for the Przewalski's horse. Native to China and Mongolia, it was declared extinct in the wild in 1970. But now 1,600 Przewalski's horses thrive in breeding programs like the one at our National Zoo's Conservation and Research Center (CRC) in Front Royal, Virginia. Last fall, a Przewalski's foal was born at the CRC and named "Mason," to celebrate the launch of a joint Smithsonian-George Mason University program in conservation biology, wildlife management and genetic and biodiversity monitoring. Zoo staff and George Mason faculty will teach at the 3,200-acre CRC facility, home to more than 30 critically endangered species.

Collaborations with universities are ongoing throughout the Smithsonian. Each year hundreds of interns and fellows come here and earn credit and degrees, and our scholars teach as adjunct faculty worldwide. The Smithsonian Tropical Research Institute formally partners with McGill University for work in tropical biology, with Princeton for study in Panama and with Harvard's Arnold Arboretum for Asian fieldwork. Our most extensive partnership—involving more than 600 Smithsonian staffers—is the Harvard-Smithsonian Center for Astrophysics. Our scientists teach Harvard courses, and our fellows earn Harvard degrees. The center also operates telescopes with universities in Arizona, Hawaii and Chile.

The National Zoo's Przewalski's foal celebrates a collaboration.

Because insect collections are crucial to medical, agricultural and environmental research, 30 years ago National Museum of Natural History (NMNH) entomologists created a consortium for graduate student training with the University of Maryland (UM) and the U.S. Department of Agriculture's Systematic Entomology Laboratory. Today NMNH continues an even broader graduate biology program with UM and also collaborates with George Washington and George Mason universities in anthropology and biology. The Smithsonian also co-hosts two graduate arts programs: the Smithsonian's Cooper-Hewitt, National Design Museum and Parsons The New School for Design, both in New York City, jointly offer an M.A. in the history of decorative arts and design; and here in Washington, The Smithsonian Associates teams with the Corcoran College of Art+Design to offer an M.A. in the history of decorative arts.

These collaborations succeed because they combine complementary elements. We provide informal education for everyone from very young children to centenarians; we also maintain impressive collections and operate several large research stations. Universities offer degrees and conduct research in fields not pursued by the Institution, such as engineering and medicine. By working together, the Smithsonian and its university partners build on each other's strengths while addressing critical global issues. We look forward to expanding these programs not only to benefit the next generation of scientists and scholars, but also our nation—and the world.

G. WAYNE CLOUGH *is Secretary of the Smithsonian Institution.*

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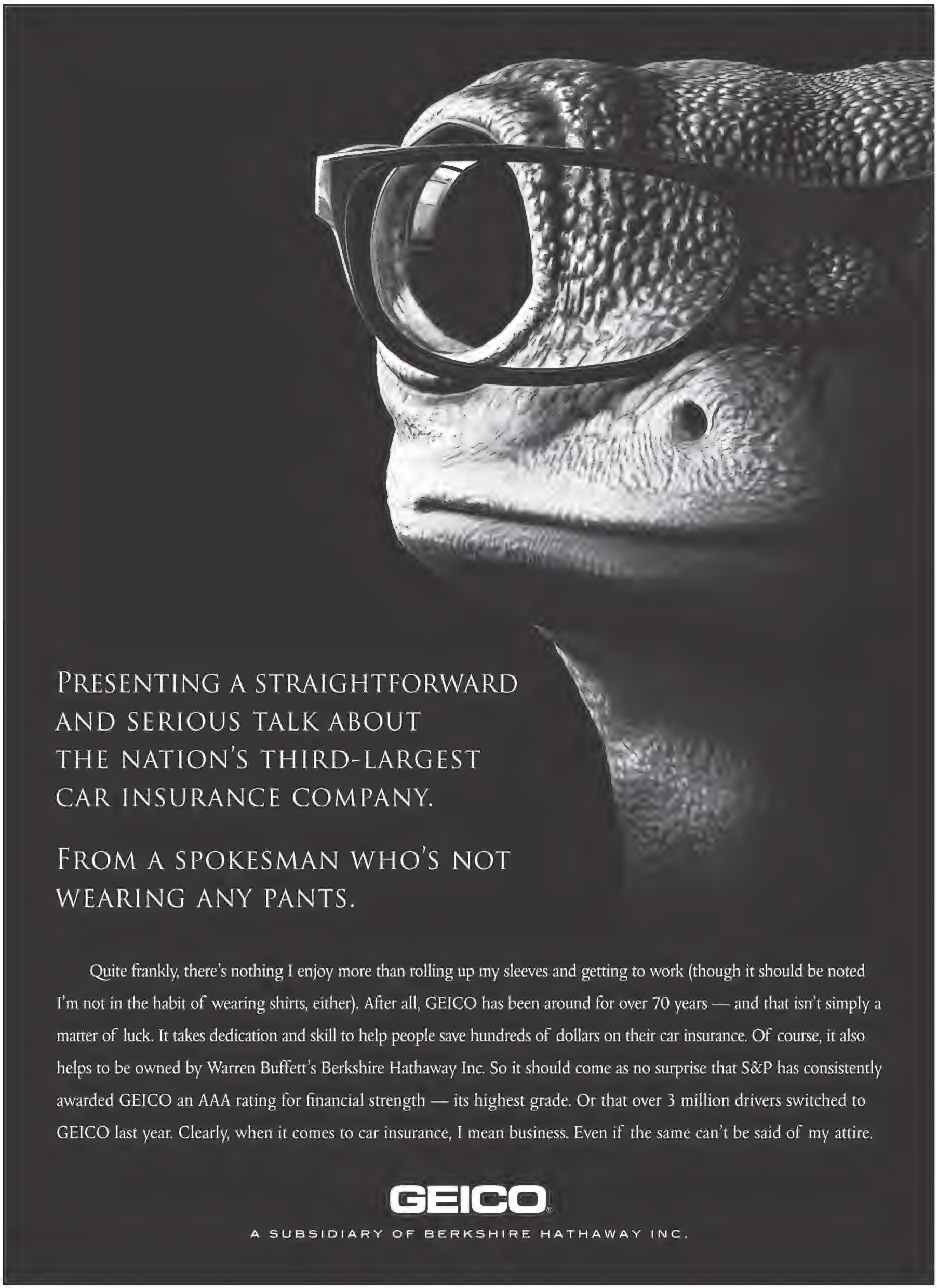

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INTELLIGENT DESIGNER

PRACTICAL INNOVATIONS THAT TOUCHED MANY LIVES

Charles Harrison, who created a more affordable View-Master and the first plastic trash can, designed 8 to 12 Sears sewing machines every year for 12 years.

IN 1966, Charles "Chuck" Harrison, an industrial designer at Sears, Roebuck & Company, got rid of an everyday nuisance—the early-morning clanging of metal garbage cans—by creating the first-ever plastic garbage bin. "When that can hit the market, it did so with the biggest bang you never heard," wrote Harrison in his 2005 book, *A Life's Design*. "Everyone was using it, but few people paid close attention to it."

And so it was for some 600 other household products that Harrison designed over his 32 years at Sears—everything from blenders to baby cribs, hair dryers to hedge clippers. Consumers snatched his wares from store shelves and ordered them from Sears' catalog. And yet few stopped to consider their maker, who at times sketched one or two product ideas an hour at his drafting table. Giving credit where credit is due, the Cooper-Hewitt, National Design Museum recently honored Harrison with its Lifetime Achievement Award.

Harrison's consumers were both housewives who wanted something more sophisticated than their mothers' inelegant, Depression-era eggbeaters, and their husbands, who took pride in their riding lawn mowers. They valued aesthetics, and so did Harrison, as long as they didn't take precedence over function. "If you look at his products, there's really nothing superfluous about them," says Bob Johnson, a former vice president at Sears.

Not surprisingly, Harrison's pet peeve is seeing a bell or whistle added to an appliance, only to have it break or become vestigial. "If it doesn't do what it's supposed to do or look like what it does, then I frown on it. I don't think a nutcracker needs to look like an elephant," says Harrison, with a laugh.

Harrison's objective to make things fit in rather than stand out mirrored his own efforts as an African-American forging a career in the industrial design field. Sears turned him down in 1956; he says a manager told him that there was an unwritten policy against hiring black people. But he found freelance work at Sears and work at a few furniture and electronics firms. (He redesigned the popular View-Master at one job.) In 1961, Sears reconsidered and Harrison joined its 20-person product design and testing laboratory. He eventually rose to become the company's first black executive.

He was also the last industrial designer to leave, in 1993, when Sears did away with its in-house design team. Harrison, 77, now teaches at the School of the Art Institute of Chicago and Columbia College Chicago. He is lenient when it comes to making his students consider what their designs might cost. "That can spoil a good piece of pie," he says. But he draws a hard line when it comes to quality. After all, he says, "What designers do will affect so many people."

MEGAN GAMBINO

HAIL TO THE CHIEF FDR delivered his fourth and final inaugural address in 1945. With the nation still at war, it was considered inappropriate to mark the occasion with festivities—and his speech, fewer than 600 words, echoed the day's solemn tone. Much of the address focused on the perils of isolationism; Roosevelt declared that World War II had taught Americans to "live as men, not as ostriches." According to Cynthia Koch, director of the Franklin Delano Roosevelt Presidential Library, FDR "was almost a teacher in chief, gently drawing homilies and lessons to help people understand his policies as a reflection of the best of our past." Go to Smithsonian.com/jukebox to hear inaugural history. ANIKA GUPTA

Check out our interview with Charles Harrison at Smithsonian.com/harrison

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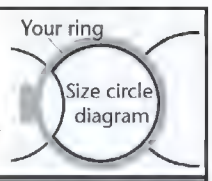

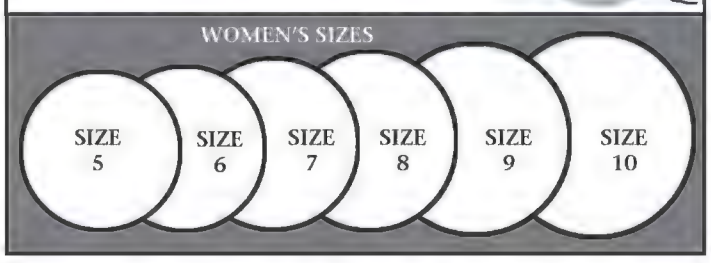

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There's No Place Like Home

IN 1939, sixteen-year-old Judy Garland donned a pair of ruby slippers and danced her way into moviegoers' hearts in *The Wizard of Oz*. The Smithsonian National Museum of American History (NMAH)—which reopened this past November after a two-year renovation—boasts a rare pair now on display.

In the children's novel by L. Frank Baum, on which the film was based, Dorothy's magical shoes were silver. The idea to change them to ruby red came from Noel Langley, one of the film's screenwriters—probably because the color would stand out better against a yellow brick road. Legendary Hollywood costumer Adrian designed the slippers—which owe their glitter to burgundy sequins. After filming, the shoes went into storage, where they were forgotten amid the studio's extensive collection of costumes. In 1970 a pair found in the basement of MGM's wardrobe department were sold at auction for $15,000 to a still-anonymous buyer, who donated them to the Smithsonian in 1979. Four other pairs are known to exist: one commanded $666,000 on the auction block in 2000.

NMAH curator Dwight Blocker Bowers says the shoes are a perennial favorite for visitors, who remember Dorothy's wish as she clicked her heels. "It's the idea," he says, "of 'there's no place like home' and that there is a warm place to cling to—it's a shared memory." **JESSE RHODES**

GAMMA PRESSE; MGM / KOBAL COLLECTION; HUGH TALMAN / NMAH, SI; SACKLER GALLERY, SI

Q&A

Pulitzer Prize-winning author **N. SCOTT MOMADAY**, a Kiowa Indian from Oklahoma, operates the Buffalo Trust, a nonprofit organization working to perserve Native cultures. He often lectures at the Museum of the American Indian. He spoke with Kenneth R. Fletcher.

WHAT ASPECTS OF NATIVE AMERICAN CULTURE INSPIRE YOUR WORK? The respect for the natural world is certainly one of them. Also, a keen sense for aesthetics. My father was a painter and he taught art. He once said to me, "I never knew an Indian child who could not draw."

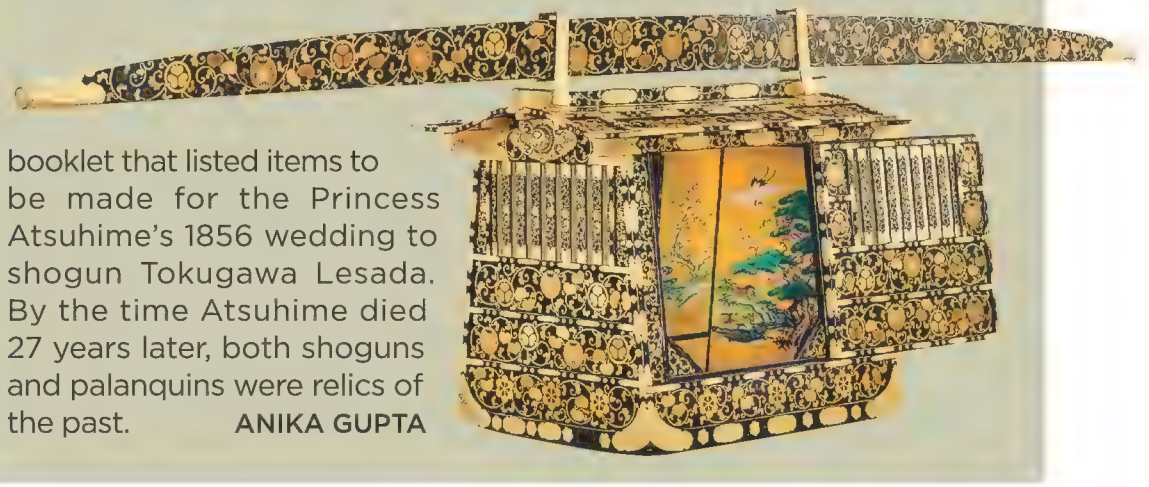
WHAT ARE THE GOALS OF THE BUFFALO TRUST? We now have more Indians living in urban communities than on reservations. It's that detachment from the land that weakens their hold on the traditional world. The Buffalo Trust is building a campground in southwestern Oklahoma where young Indian people can come and be exposed to the teachings of elders. I'm hoping to see more hands-on training in traditional arts and crafts—for instance, young people learning to tan a buffalo hide, construct a tepee and prepare traditional medicines and foods.

YOUR WORK ALSO STRESSES THE IMPORTANCE OF ORAL TRADITIONS. WHAT PLACE DOES THAT HAVE IN INDIAN CULTURE? Indians are marvelous storytellers. In some ways, that oral tradition is stronger than the written tradition. Seeing *Hamlet* performed on stage is an example of oral tradition at its core. You experience the sound of the language, the gestures of the actors, the inflections and the silences. Like Shakespeare, the Indian has a lot to teach the rest of us about language in its essence.

Visit Smithsonian.com/momaday to read more of our interview with Momaday

MAKING HISTORY

EASY RIDER In 1984, curator Ann Yonemura purchased a ceremonial palanquin—a form of transport favored by warlords in 19th-century Japan—for the then yet-to-be-opened Sackler Gallery of Art. "It had these three-leafed circular crests and heavy gold and silver ornamentation," she says. "And it required six men to carry it." Such elaborately decorated conveyances were reserved for the shogun's family, especially his brides. But curators could not determine for whom the 51-inch-tall palanquin was made—until now. Shin'ichi Saitoh, a curator at the Tokyo Metropolitan Edo-Tokyo Museum, finally found the answer in the National Archives of Japan, in a booklet that listed items to be made for the Princess Atsuhime's 1856 wedding to shogun Tokugawa Lesada. By the time Atsuhime died 27 years later, both shoguns and palanquins were relics of the past. **ANIKA GUPTA**



What's Up

GOLD FILLINGS

Japanese artisans repaired broken crockery by plugging the cracks with plant resin lacquer and gold dust (left: bowl). See 14 of these precious patch-ups at the Freer Gallery of Art until May 10.

MAKING SPACE

Artists celebrate the 50th anniversary of space exploration in this collection of 73 works (left: *Fluid Dynamics* by Tina York). See the Smithsonian traveling exhibit until January 18 at the Art League of Bonita Springs, in Florida.

THE EYES HAVE IT

Famous faces take on a different look when seen in unfamiliar surroundings (left: Jack Nicholson by Martin Schoeller). Study the gazes of both celebrities and unknowns in a gallery of pictures taken by six prominent modern photographers. At the National Portrait Gallery until May 10.

SUM OF THE PARTS

Hands, feet and bodies abound in contemporary figurative art. The Hirshhorn displays Giacometti's metal physiques, Magritte's disembodied limbs and other modern "body" art (below: by Robert Gober) through November 8.

BACK TO NATURE

Newborn lions, gape-mouthed fish (right: by Gary Brennand) and puzzled penguins are among the 45 best nature photographs in 2008, as chosen by the Windland Smith Rice International Awards. Take a walk on the wild side at the Museum of Natural History until May 3.

BY ANIKA GUPTA

FREER GALLERY, SI; TINA YORK / NASA ART PROGRAM / SITES; MARTIN SCHOELLER / HASTED HUNT GALLERY, NEW YORK / NPG, SI; HIRSHHORN MUSEUM, SI; GARY BRENNAND / NATURE'S BEST PHOTOGRAPHY 2008 WINDLAND SMITH RICE INTERNATIONAL AWARDS / NMNH, SI

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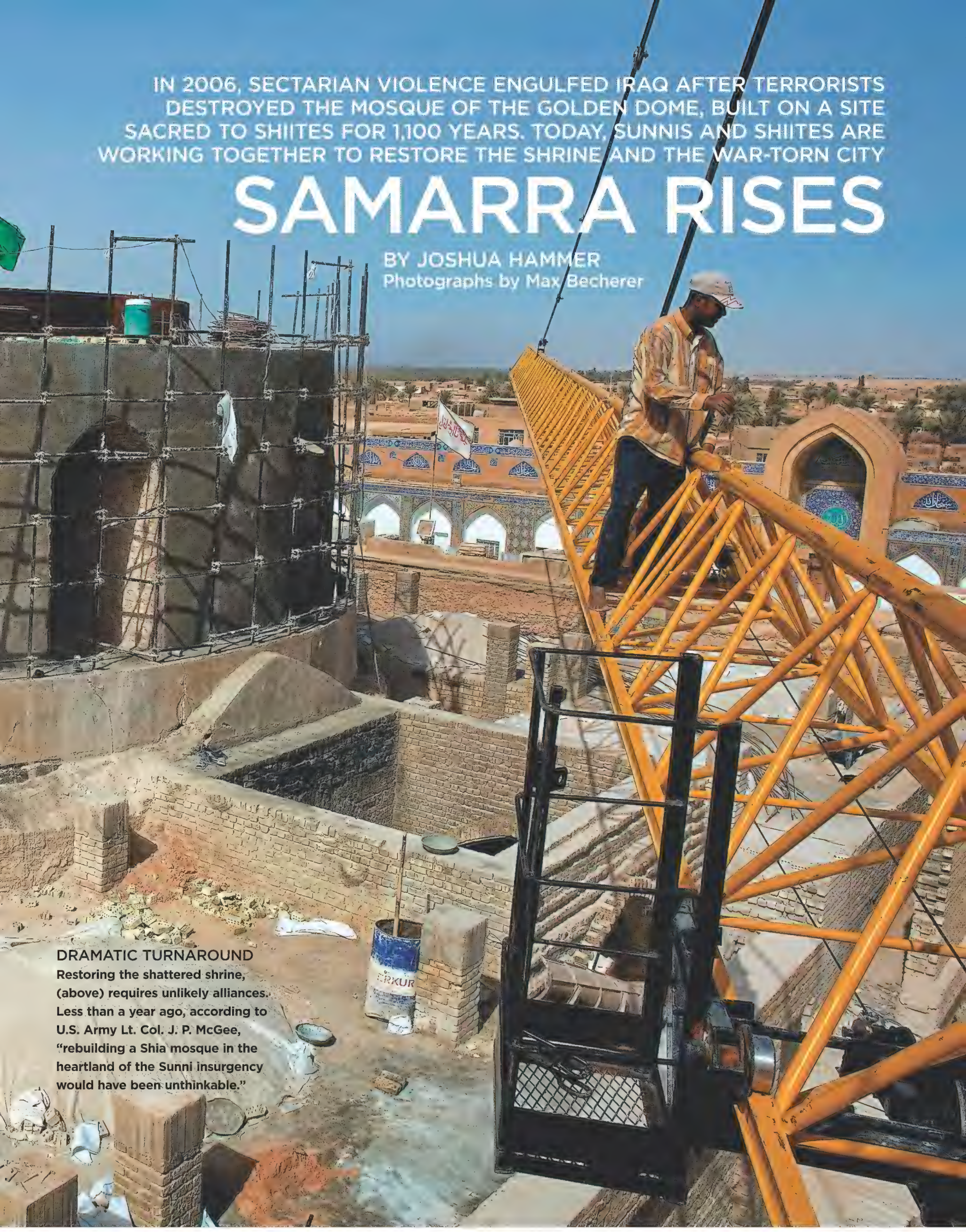
IN 2006, SECTARIAN VIOLENCE ENGULFED IRAQ AFTER TERRORISTS DESTROYED THE MOSQUE OF THE GOLDEN DOME, BUILT ON A SITE SACRED TO SHIITES FOR 1,100 YEARS. TODAY, SUNNIS AND SHIITES ARE WORKING TOGETHER TO RESTORE THE SHRINE AND THE WAR-TORN CITY

SAMARRA RISES

BY JOSHUA HAMMER
Photographs by Max Becherer



DRAMATIC TURNAROUND
Restoring the shattered shrine, (above) requires unlikely alliances. Less than a year ago, according to U.S. Army Lt. Col. J. P. McGee, "rebuilding a Shia mosque in the heartland of the Sunni insurgency would have been unthinkable."

I'm standing on a street corner in the center of Samarra— a strife-scarred Sunni city of 120,000 people on the Tigris River in Iraq—surrounded by a squad of American troops. The crackle of two-way radios and boots crunching shards of glass are the only sounds in this deserted neighborhood, once the center of public life, now a rubble-filled wasteland. I pass the ruins of police headquarters, blown up by an Al Qaeda in Iraq suicide truck bomber in May 2007, and enter a corridor lined by eight-foot-high slabs of concrete—"Texas barriers" or "T-walls," in U.S. military parlance. A heavily guarded checkpoint controls access to the most sensitive edifice in the country: the Askariya Shrine, or Mosque of the Golden Dome, one of the holiest sites in Shia Islam.

Here, in February 2006, Al Qaeda militants blew up the delicate gold-tile dome atop the thousand-year-old Shiite shrine, igniting a spasm of sectarian killing that brought the country to the edge of civil war. For the past year and a half, a committee led by Iraqi Prime Minister Nuri al-Maliki has been working with United Nations consultants to clear debris from the site and to begin rebuilding the Golden Dome—a $16 million project that aims to restore the shrine sufficiently to receive Shiite pilgrims by this summer.

I've been trying for three days to get close to the shrine, stymied by an order from al-Maliki's office barring journalists from the site—an indication of how sensitive the bombing remains in this country. U.S. military officers in Samarra have pulled strings on my behalf with the mayor, Iraqi police officials and the Ministry of Planning in Baghdad. This time, after I reach the checkpoint, a friendly commander of the Askariya Brigade, a predominantly Shiite police force dispatched from Baghdad last year to guard the site, makes a call to his superiors in the Iraqi capital, then escorts me through.

As I approach the shrine in the 120-degree heat, I take in evidence of battles between U.S. troops and Al Qaeda that ripped Samarra apart for five years, making it, according to one U.S. general, "the most destroyed city in Iraq." I pass a bullet-pocked hotel, shuttered trinket and mobile-phone shops, and a closed *madrassah*, or Islamic school. Heaps of debris have been neatly laid along both sides of the road. The stump of the once-glorious dome is now covered with wooden scaffolding. A few golden tiles still cling to jagged remnants of the bruised and broken structure. Near the main gate of the Askariya Shrine, I see the first sign of activity in an otherwise moribund landscape: a bulldozer, laden with fragments of the dome, rumbles through the portal toward a dumping ground nearby.

A dozen laborers bustle about the courtyard, which is filled with broken pillars and chunks of concrete bristling with exposed rebar. The whine of a pneumatic drill and the rhythmic pounding of a hammer resound from inside the shrine. "We have 120 workers on the site, working day and night, in two 12-hour shifts," Haidar al-Yacoubi tells me. A Shiite from Baghdad who has served as a technical adviser to the project since April, he adds: "*Al Hamdulillah* [praise God], the dome will rise again."

JANE SWEENEY / LONELY PLANET IMAGES; HAMEED RASHEED / AP IMAGES; PP. 28-29 MAX BECHERER / POLARIS IMAGES

For nearly 11 centuries, the Askariya Shrine has been revered by Shiite Muslims as a symbol of sacrifice and martyrdom. The original building was constructed in A.D. 944, as the final resting place for Ali al-Hadi and his son, Hassan al-Askari, Shiite imams who had lived under house arrest—and were allegedly poisoned—at the military camp of the Sunni caliph al-Mu'tasim, when Samarra was the capital of the Islamic world. In 1905, the 150-foot dome, covered in 72,000 gold tiles and surrounded by pale-blue walls, was built above the shrine, signifying its importance; many of the faithful regard only the mosques of Najaf and Karbala as holier. Enhancing the sanctity of the compound is the adjacent Blue Mosque, built over a *sardhab*, or cellar, where Muhammad al-Mahdi, the Twelfth or Hidden Imam, withdrew and then disappeared in the ninth century. Shiites believe that al-Mahdi will one day rise from his "crypt" below the mosque, ushering in man's redemption and the end of the world.

For many Shiites, something close to the end of the world occurred on the morning of February 22, 2006, after eight Al Qaeda terrorists disguised in Iraqi military uniforms entered the shrine, overpowered guards, fixed explosives to the golden dome and blew it to pieces. The attack was a key part of Al Qaeda's strategy to foment civil war between Shiite and Sunni Muslims in Iraq, thereby sowing chaos, driving out occupying U.S. forces and turning the country into a fundamentalist caliphate. No one was killed in the attack, but within hours, as Al Qaeda's leadership had hoped, the violent spiral began: Shiite militants set fire to at least two dozen Sunni mosques in Baghdad and killed three imams. Sunnis retaliated by killing Shiites. Soon Baghdad—and much of the rest of Iraq—was caught in a vicious cycle of car bombings, kidnappings, murders and ethnic cleansing. By the end of that year, more than 10,000 people had died across the country. Samarra, meanwhile, sank deeper into destitution and despair, neglected by the Shiite-dominated government, avoided by contractors, and fought over by U.S. forces and a range of insurgent groups. "The city was dead," Mahmoud al-Bazzi, mayor of Samarra, tells me.

Today, however, after thousands of former Sunni insurgents came over to the American side; the "surge" of 30,000 U.S. troops ordered by President George W. Bush in early 2007 increased security; and a wave of successful U.S. and Iraqi strikes against Al Qaeda in Iraq put the terrorists on the defensive, the worst of Iraq's violence appears to be over. In Samarra, markets have come back to life and playgrounds are filled with children. And the very symbol of the country's descent into sectarian carnage—the Askariya Shrine—has brought together Sunnis and Shiites in a rebuilding effort. The endeavor, city officials and U.S. soldiers alike hope, will bring back hundreds of thousands of Shiite pilgrims from Iran, the Gulf States and beyond; restore Samarra's economic fortunes; and narrow Iraq's sectarian rift. "Rebuilding a Shia mosque in the heartland of the Sunni insurgency would have been unthinkable" less than a year ago, says Lt. Col. J. P. McGee, commander of the Second Battalion, 327th Infantry, based in Samarra since October 2007. "That's a powerful symbol of how Iraq has changed."

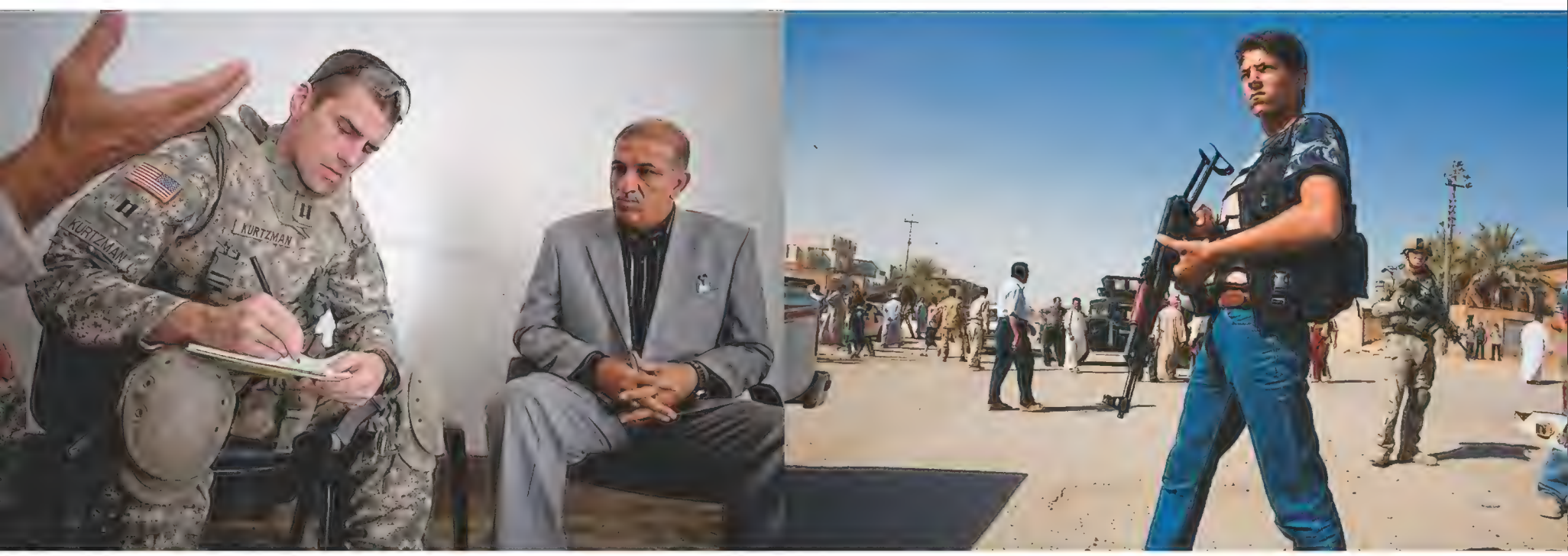
But peace in Samarra, as in the rest of Iraq, remains fragile. The city has become, in effect, a giant

MAP: GUILBERT GATES; MARTIN SPECHT / FOCUS AGENCY / WPN

AN INTENSIFYING SPIRAL OF VIOLENCE

After Al Qaeda in Iraq blew up the Askariya Shrine (opposite, far left: the mosque pre-attack, and left: after the assault), already raging conflict escalated in Samarra (below: U.S. troops in 2007). Destruction of the shrine unleashed full-scale sectarian killing in Iraq. "We were fighting daily with Al Qaeda," recalls Samarra-based U.S. Army Capt. Joshua Kurtzman. "Every patrol we went on, we were in a firefight or were encountering IEDs."

prison, isolated by an encircling berm, and divided by mazes of T-walls and sandbagged checkpoints. Remnants of Al Qaeda lurk in the surrounding desert, still recruiting among Samarra's youth and waiting for opportunities to strike. Prime Minister al-Maliki, deeply suspicious of Sunni paramilitary units outside the jurisdiction of the Shiite-dominated government, has moved to take control of the former insurgents, known as the Sons of Iraq, and drastically reduce their numbers. The Sons of Iraq have asserted that if they don't receive jobs—either in the Iraqi security forces or in public works projects—they could take up arms again. Should that happen, the tenuous security in Samarra that has made the shrine project possible could collapse overnight. Moreover, the effort itself, although showcased by the government as a powerful example of reconciliation, has been mired in political gamesmanship and sectarian suspicion for the past year, and its success is by no means assured.



I flew into Samarra by Black Hawk military helicopter from Baghdad on a steamy night early this past September, sweeping low over the Tigris River for much of the 70-mile, 45-minute journey. Although attacks against coalition forces have dropped dramatically, moving anywhere in the country remains risky: the next morning, I made the short journey from the airfield to the city in a vehicle called an MRAP (for mine-resistant ambush protected), a 38,000-pound armored behemoth with a 12-foot-high turret topped by a 50-caliber machine gun. The intimidating truck—also known as a Cayman—was introduced by the U.S. Army last February here in Salahuddin province to replace the Humvee, which is far more vulnerable to attacks by IEDs—improvised explosive devices. "The MRAPs have saved a lot of lives," a specialist riding in my Cayman told me. But they aren't foolproof: on July 9, 2008, Sgt. First Class Steven Chevalier—driving a Cayman through central Samarra—was killed by an RKG3 thermal grenade, a handheld canister filled with flammable pellets capable of penetrating armor. On August 15, a second RKG3 exploded inside another Cayman, critically burning four U.S. soldiers.

We crossed the Tigris over a dam; just downstream, hundreds of Iraqis were trying to beat the oppressive heat by swimming off a sandy bank. Soon we arrived at Patrol Base Olson, a Saddam-era casino built along the river and cut off from the rest of the city by rows of T-walls. This heavily fortified compound is the home of the 150 soldiers of Charlie Company, which has led the fight against Al Qaeda in Samarra, recruited fighters from the Sons of Iraq and helped secure the area around the Askariya Shrine. We pulled into the compound in a cloud of dust, and I stepped from the vehicle into a parking lot littered with bullet casings and crushed, half-empty water bottles. Inside the former casino—now Charlie Company's weapons depot, cafeteria, Internet café and Tactical Operations Center (TOC)—I was welcomed by Capt. Joshua Kurtzman, 29, the company commander. An army officer's son and West Point graduate who crossed from Kuwait with the original invasion force, Kurtzman was now serving his third tour in Iraq.

Sitting in his cluttered office at the TOC—one of the few corners of Patrol Base Olson with functioning air conditioning—Kurtzman recounted the marathon U.S. effort to bring Samarra under control during the past five years. U.S. forces arrived in the city in April 2003 and faced a growing insurgency within six months. A succession of U.S. offensives killed hundreds of militants and destroyed large parts of the city. But U.S. attempts to drive out the insurgents never succeeded. By late 2005, Al Qaeda controlled Samarra, with U.S. troops safe only inside Patrol Base Olson and a heavily fortified "Green Zone" adjacent to it.

Kurtzman recalled the dark days of Al Qaeda's rule in the city: militants cruised the streets with antiaircraft machine guns mounted on white Toyota pickup trucks. Public exe-

Freelance writer **JOSHUA HAMMER** *is based in Berlin.*
Photographer **MAX BECHERER** *lives in Cairo.*

MAX BECHERER / POLARIS IMAGES (3)

ACHIEVING A TENUOUS TRUST

In 2007, U.S. forces in Samarra implemented a bold strategy: negotiate with Sunni insurgents and offer wages to join American efforts (opposite, far left: Capt. Joshua Kurtzman, with Sunni leader Abu Mohammed; left: a former fighter overseeing a checkpoint; and above: Sunni sheik Riyath al-Nissani pays his men). But the Shiite-dominated Iraqi government is forcing cuts in the program, creating, says Kurtzman, "a lot of anxiety" among Sunnis.

cutions were held in Samarra's main market. Contractors, shopkeepers, even Sunni imams, were forced to hand over salaries to the militants. Ninety percent of the 40 or so fuel trucks destined for Samarra every few days were hijacked by Al Qaeda, their contents sold on the black market for up to $50,000 per truckload. In June 2007, militants again infiltrated the Askariya Shrine and blew apart the minarets. A month earlier, a suicide truck bomber had attacked police headquarters, killing the commander and 11 of his troops, and driving the rest of the force—700 men—out of the city. "We were fighting daily with Al Qaeda," said Kurtzman. "We had nine IEDs in a three-hour period on [one road through town]. Every patrol we went on, we were in a firefight or were encountering IEDs."

Then, in December 2007, the Iraqi government and its U.S. allies began to take back the city. The troops raised watchtowers and secured a berm that had been built around the city in 2005. Beginning a few months earlier, the Iraqi government had begun dispatching a national police brigade—4,000 strong—made up of both Sunnis and Shiites, along with a Kurdish battalion of the Iraqi Army. U.S. troops entered negotiations with Sunni insurgents, who had become fed up with Al Qaeda's tactics—including setting off car bombs inside Samarra. "Al Qaeda wanted to fight everybody," Abu Mohammed, leader of the Sons of Iraq in Samarra, told me. "They killed a lot of innocent people, from all levels of society." A deal was signed last February, and 2,000 Sunni fighters—many of whom had spent years arming IEDs to kill American troops—were given one to three days of weapons training.

The Sons of Iraq manned checkpoints and began feeding their new U.S. allies intelligence. "They'd say, 'My brother, who lives in this neighborhood, told me there's a cache here and there are six guys guarding it,'" Kurtzman recounted. U.S. and Iraqi forces conducted pinpoint raids, engaged Al Qaeda in firefights and, in time, drove its members out of Samarra.

In an innovation first tried in Anbar province, U.S. troops also undertook a census of Samarra, registering every adult male in the city, scanning irises and taking fingerprints. According to U.S. Army data, hostile actions against American troops dropped from 313 in July 2007 to 5 in October 2008. "I sit here now and say, 'Man, I wish we'd thought of this two years ago,'" says Capt. Nathan Adams, who was based in Samarra in 2005 also. "But we were not ready then, and the Iraqi [insurgents] were not either. They needed to fight the superpower, to save face, then negotiate back to the middle ground." After six months of cooperation, "Al Qaeda's cells are dormant," Kurtzman told me. "They are hiding out in the middle of the desert, just trying to survive."

One evening I toured Samarra with Kurtzman and a platoon of soldiers from Charlie Company. We climbed into three Caymans and rumbled into the moonless night; the delicate turquoise dome of the Blue Mosque, bathed in fluorescent light, loomed just beyond the patrol base. It was the first week of Ramadan, and the streets were nearly deserted; most people were still at home for *iftar*, the feast at sundown that breaks the dawn-to-dusk fast. Only a few groceries, textile shops and restaurants were open, lit by small generators. Samarra's sporadic electricity was out again—no surprise in a city with few functioning services. "The Iraqi provincial government put half a million dollars into a water treatment plant, but there's no chlorine, so you might as well be drinking the Tigris with a straw," Kurtzman told me.

We dismounted and walked up the road to the main Sunni mosque in Qadisiya, an affluent quarter dominated during Saddam's time by high-level Baathists and army officers. Just a few months ago, Kurtzman said, troops returning to base from firefights with the militants would hear the muezzin call for jihad against America. But the main council of Sunni mosques in Iraq fired the imam last winter, and the radical messages stopped. "Six months ago, I would not have been standing right here," says Kurtzman. "I'd have been shot at." A crowd of children from an adjacent playground—a provincial government project completed a month ago—gathered around the platoon, along with a few adults. Kurtzman chatted them up, his interpreter by his side.

"It's good to see everybody outside tonight."

MAX BECHERER / POLARIS IMAGES (2)

The kids clustered excitedly, trying out a few words of English, hoping for a pen or another small gift. "This must be the hottest place on earth right now," Kurtzman said. "The weather in Saudi Arabia is 105. It's 120 degrees here."

The men murmured their assent.

"So how much power are you getting here? Two hours on, five hours off?"

"Maybe a couple of hours during the day, a couple of hours at night. That's all."

A Sons of Iraq member stepped forward and began complaining about his employment prospects. I had been told that under intense pressure from the Iraqi government, the U.S. Army had dropped 200 Sunni fighters from its payroll in just the past month and would have to lay off another thousand in the months to come. In addition, salaries, now at $300 a month, were being renegotiated and could drop by a third. "There's a lot of anxiety out there," Kurtzman told me, as we climbed back into the Cayman.

From its earliest days, the effort to rebuild the Askariya Shrine has been beset by the violence and sectarian tensions that tormented so much of Iraq. Immediately after the bombing, then-Prime Minister Ibrahim al-Jaafari, a Shiite, called for United Nations help in restoring it. A few weeks later, Unesco representatives in Paris and Amman, Jordan, agreed to underwrite an Iraqi proposal to train Iraqi technicians and architects, and help rebuild not only the shrine, but Sunni mosques and churches across Iraq. In April 2006, a team from the Iraqi Ministry of Planning set out for Samarra by road for the first on-site assessment. The trip was aborted, however, after word reached the team that an ambush was planned by Al Qaeda. For months afterward, "We searched for international experts to go there, but the reaction was, 'No way,'"

BRIDGING THE GREAT DIVIDE

Reconstruction of the Askariya Shrine is emblematic of the push for Sunni-Shiite reconciliation. (Left: inside the shrine, a worshiper in the damaged foyer, and below: a security guard skirts decorative gold-strewn rubble.) The collaborative effort, says Lt. Col. J. P. McGee, represents a "powerful symbol of how Iraq has changed." Despite progress, however, the project continues to be slowed by deep sectarian suspicion on both sides.

Mohamed Djelid, director of Unesco in Iraq, told me.

In June 2007, Unesco awarded a contract to Yuklem, a Turkish construction company, to conduct a feasibility study and make initial preparations—cleaning and production of architectural drawings—for the dome's reconstruction. "They sent one expert to Samarra, two times," Djelid said. Then came the destruction of the minarets in June 2007, which frightened off the Turks and made even some Unesco officials skittish about staying involved. "I myself was hesitating about whether Unesco should put our experts in this kind of situation," Djelid said. "But if we stopped, we were concerned about the consequences. What kind of message would that send?" Late that year came another setback: Turkish troops began pushing into Kurdish Iraq in pursuit of PKK Kurdish separatist guerrillas. In the face of an anti-Turkish backlash in Iraq, Yuklem became even more reluctant to send its technicians to Samarra.

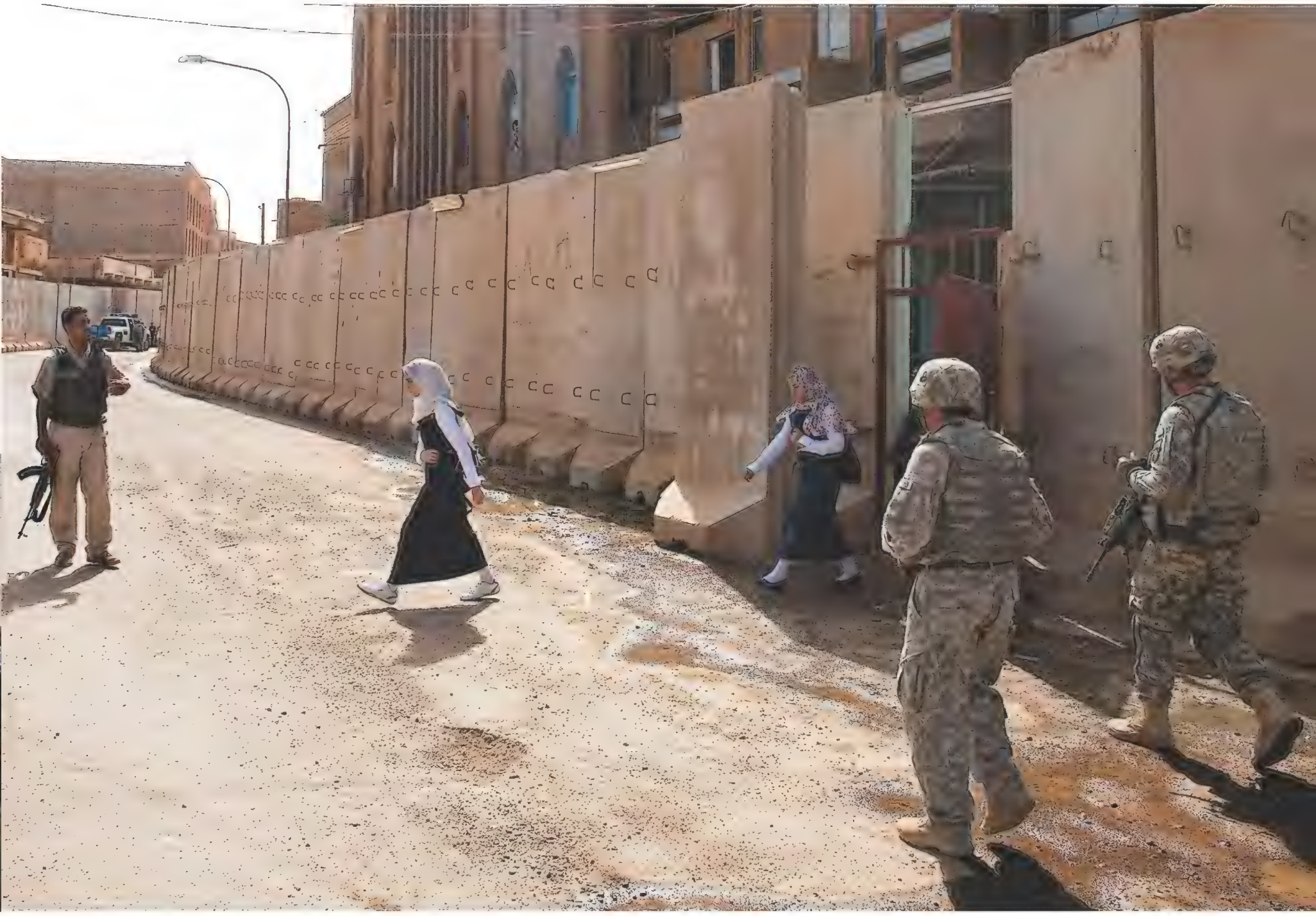
But in December 2007, a small team of Unesco experts from across the Muslim world—Egyptians, Turks and Iranians—arrived in Samarra and set up an office near the Askariya Shrine. "The shrine was a mess, it was catastrophic, it was clear it was going to be a big challenge," said Djelid. Then the contract with the Turkish company, which had failed to begin work on the risky mission, was canceled. Al-Maliki appointed a task force to take control of the feasibility study, clear the site, and stabilize and protect what remained of the Golden Dome. But while the reconstruction project has been gaining momentum, it still remains enmeshed in sectarian politics. Some Sunnis in Samarra believe that al-Maliki's committee is acting as a front for Tehran, and that the presence of Iranians on the Unesco team is part of a plot to impose Shiite dominance in a Sunni city. "The Iranians have taken over this project," charges Suhail Najm Abed, a local Unesco consultant. "We threw out Al Qaeda, but we are bringing in another Hezbollah," referring to the Lebanese Shiite guerrilla group funded by Iran. For his part, Djelid defends using Iranian engineers: "[They] have a lot of expertise," he says. "When we discuss it with the population of Samarra, most tell us, 'If the Iranians are coming under the umbrella of Unesco, we have no problem.'"

Meanwhile, Unesco has been engaged in a debate with the Iraqi government about whether to rebuild the dome with modern materials or to remain faithful to the original construction, which could prolong the project by years. No one can predict with certainty when the dome will rise again. Unesco says that it expects only clean-up efforts and surveying to be completed by this summer.

On my last evening in Samarra, Kurtzman took me to meet Abu Mohammed, a former insurgent commander turned Sons of Iraq leader. As the muezzin from an adjacent mosque was blaring the post-iftar call to prayer, we pulled up in three Caymans to a handsome villa in Qadisiya. Abu Mohammed—an imposing and lean-faced man in his early 50s, clad in a white *dishdasha*, or traditional robe—greeted us in his courtyard and motioned for us to sit on plastic chairs arranged in a circle. Half a dozen other members of the Sons of Iraq welcomed us, including Abu Farouk, a hawk-nosed chain smoker and former tank driver in the Iran-Iraq war. Kurtzman had told me earlier that Abu Mohammed had led mortar teams against U.S. troops at the height of the Iraq insurgency, drawing on his experience as a rocket battalion commander in the Iraqi Army under Saddam. "In every country being occupied, there will be resistance," the former insurgent now began, balancing his 5-year-old son, Omar, in his lap. "And this is the legal right for any nation."

Abu Mohammed told me that his Sunni fighters had joined forces with the Americans last February only after their overtures to the Iraqi government had been rebuffed. "The U.S. was our last option," he acknowledged. "When the Americans came to this city, we didn't have a shared enemy. But now we have an enemy which both sides want

MAX BECHERER / POLARIS IMAGES (3)



MAKING WAY FOR THE FUTURE

In a city where chaos and killing reigned only recently, stability may be taking hold. (Opposite, far left: Captain Kurtzman makes purchases from a shopkeeper; left: Samarra mayor Mahmoud al-Bazzi and soldiers of Charlie Company distribute classroom supplies; and above: children set out for school.) In Samarra, says Sunni leader Abu Mohammed, Al Qaeda in Iraq was repulsed because "they killed a lot of innocent people, from all levels of society."

to fight." The cooperation had been fruitful, Abu Mohammed said, yet he was concerned about the future. Al-Maliki's Shiite-dominated government was about to take control of the 53,000 Sunni fighters in Baghdad, and would soon turn its attention to Anbar and Salahuddin provinces. Despite talk of integrating the Sons of Iraq into the Iraqi security forces, he said, "we've tried to get the government to hire some of our fighters as policemen. But until now we didn't see a single person hired."

Kurtzman confirmed that even though Samarra's police force is woefully understrength, the Iraqi government was dragging its feet in hiring. "A Shia-dominated central government in a city that blew up one of the holiest shrines in the Shia world has a lot of bitterness against the people [of Samarra]," Kurtzman said. "That's why, in nine months, you haven't gotten police hired from here." Abu Mohammed insisted that his men were committed to peace, that rebuilding the shrine would benefit everyone in Samarra. But stability, he said, depended on jobs for the Sons of Iraq, and "we don't trust the Iraqi government."

Back at the Askariya Shrine, Haidar al-Yacoubi, the Shiite from Baghdad who serves as a technical adviser to the reconstruction project, gestured proudly at the workers sorting rubble in the courtyard. The integration of Shiites and Sunnis at the site, he said, would send a message to the world. "We don't make the Sunni-Shia difference important here," al-Yacoubi said, as we watched a Caterpillar bulldozer push debris through the mosaic-inlaid main gate. "Iraq is a kind of rainbow, so when we rebuild this mosque, we try to pick from each [group]." It remains to be seen, of course, whether such generous sentiments can be sustained—not only at the Mosque of the Golden Dome, but in Samarra and the rest of Iraq.

See more of Max Becherer's images of Samarra at Smithsonian.com/samarra

COMMANDER IN CHIEF

A self-taught strategist with no combat experience, Lincoln saw the path to victory more clearly than his generals

BY JAMES M. MCPHERSON

WHEN THE AMERICAN CIVIL WAR BEGAN, PRESIDENT ABRAHAM Lincoln was far less prepared for the task of commander in chief than his Southern adversary. Jefferson Davis had graduated from West Point (in the lowest third of his class, to be sure), commanded a regiment that fought intrepidly at Buena Vista in the Mexican War and served as secretary of war in the Franklin Pierce administration from 1853 to 1857. Lincoln's only military experience had come in 1832, when he was captain of a militia unit that saw no action in the Black Hawk War, which began when Sac and Fox Indians (led by the war chief Black Hawk) tried to return from Iowa to their ancestral homeland in Illinois in alleged violation of a treaty of removal they had signed. During Lincoln's one term in Congress, he mocked his military career in an 1848 speech. "Did you know I am a military hero?" he said. "I fought, bled and came away" after "charges upon the wild onions" and "a good many bloody struggles with the Musquetoes."

When he called state militia into federal service on April 15, 1861—following the Confederate bombardment of Fort Sumter—Lincoln therefore faced a steep learning curve as commander in chief. He was a quick study, however; his experience as a largely self-taught lawyer with a keen analytical mind who had mastered Euclidean geometry for mental exercise enabled him to learn quickly on the job. He read and absorbed works on military history and strategy; he observed the successes and failures of his own and the enemy's military commanders and drew apt conclusions; he made mistakes and learned from them; he applied his large quotient of common sense to slice through the obfuscations and excuses of military subordinates. By 1862 his grasp of strategy and operations was firm enough almost to justify the overstated but not entirely wrong conclusion of historian T. Harry Williams: "Lincoln stands out as a great war president, probably the greatest in our history, and a great natural strategist, a better one than any of his generals."

As president of the nation and leader of his party as well as commander in chief, Lincoln was principally responsible for shaping and

As a graduate of West Point and a former U.S. secretary of war, Jefferson Davis (above: c. 1863) was well-suited to his role as commander in chief of the Confederate forces. Lincoln (right: at Antietam in 1862 with security guard Allan Pinkerton (left) and Maj. Gen. John McClernand) had far less military experience, having served only as a captain in a militia.

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During Lincoln's one term in Congress, he mocked his military career.

defining national policy. From first to last, that policy was the preservation of the United States as one nation, indivisible, and as a republic based on majority rule. Although Lincoln never read Karl von Clausewitz's famous treatise *On War*, his actions were a consummate expression of Clausewitz's central argument: "The political objective is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose. Therefore, it is clear that war should never be thought of as *something autonomous* but always as an instrument of policy."

Some professional military commanders tended to think of war as "something autonomous" and deplored the intrusion of political considerations into military matters. Take the notable example of "political generals." Lincoln appointed many prominent politicians with little or no military training or experience to the rank of brigadier or major general. Some of them received these appointments so early in the war that they subsequently outranked professional, West Point–educated officers. Lincoln also commissioned important ethnic leaders as generals with little regard to their military merits.

Historians who deplore the abundance of political generals sometimes cite an anecdote to mock the process. One day in 1862, the story goes, Lincoln and Secretary of War Edwin M. Stanton were going over a list of colonels for promotion to brigadier general. Coming to the name of Alexander Schimmelfennig, the president said that "there has got to be something done unquestionably in the interest of the Dutch, and to that end I want Schimmelfennig appointed." Stanton protested that there were better-qualified German-Americans. "No matter about that," Lincoln supposedly said, "his name will make up for any difference there may be."

General Schimmelfennig is remembered today mainly for hiding for three days in a woodshed next to a pigpen to escape capture at Gettysburg. Other political generals are also remembered more for their military defeats or blunders than for any positive achievements. Often forgotten are the excellent military records of some political generals like John A. Logan and

PP. 40-41 ALEXANDER GARDNER / LIBRARY OF CONGRESS; P. 38 CORBIS;
PP. 38-39 ALEXANDER GARDNER / LIBRARY OF CONGRESS

Francis P. Blair (among others). And some West Pointers, notably Ulysses S. Grant and William T. Sherman, might have languished in obscurity had it not been for the initial sponsorship of Grant by Congressman Elihu B. Washburne and of Sherman by his brother John, a U.S. senator.

Even if all political generals, or generals in whose appointments politics played a part, turned out to have mediocre military records, however, the process would have had a positive impact on *national* strategy by mobilizing their constituencies for the war effort. On the eve of the war, the U.S. Army consisted of approximately 16,400 men, of whom about 1,100 were commissioned officers. Of these, some 25 percent resigned to join the Confederate army. By April 1862, when the war was a year old, the volunteer Union army had grown to 637,000 men. This mass mobilization could not have taken place without an enormous effort by local and state politicians as well as by prominent ethnic leaders.

Another important issue that began as a question of national strategy eventually crossed the boundary to become policy as well. That was the issue of slavery and emancipation. During the war's first year, one of Lincoln's top priorities was to keep border state Unionists and Northern antiabolitionist Democrats in his war coalition. He feared, with good reason, that the balance in three border slave states might tip to the Confederacy if his administration stepped prematurely toward emancipation. When Gen. John C. Frémont issued a military order freeing the slaves of Confederate supporters in Missouri, Lincoln revoked it in order to quell an outcry from the border states and Northern Democrats. To sustain Frémont's order, Lincoln believed, "would alarm our Southern Union friends, and turn them against us—perhaps ruin our rather fair prospect for Kentucky. . . . I think that to lose Kentucky is nearly the same as to lose the whole game. Kentucky gone, we can not hold Missouri, nor as I think, Maryland. These all against us, and the job on our hands is too large for us. We would as well consent to separation at once, including the surrender of this capitol."

During the next nine months, however, the thrust of national strategy shifted away from conciliating the border states and anti-emancipation Democrats. The antislavery Republican constituency grew louder and more demand-

Lincoln's lack of military training at first inclined him to defer to General in Chief Winfield Scott (above: 1865). But Scott's lack of energy and initiative disillusioned the president. Scott's successor, Gen.George B. McClellan (left: with Lincoln in 1862 at Antietam and below, with his wife, c. 1863), proved an even greater disappointment to the wartime president.

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ing. The argument that slavery had brought on the war and that reunion with slavery would only sow the seeds of another war became more insistent. The evidence that slave labor sustained the Confederate economy and the logistics of Confederate armies grew stronger. Counteroffensives by Southern armies in the summer of 1862 wiped out many of the Union gains of the winter and spring. Many northerners, including Lincoln, became convinced that bolder steps were necessary. To win the war over an enemy fighting *for* and sustained *by* slavery, the North must strike *at* slavery.

In July 1862, Lincoln decided on a major change in national strategy. Instead of deferring to the border states and Northern Democrats, he would activate the Northern antislavery majority that had elected him and mobilize the potential of black manpower by issuing a proclamation of freedom for slaves in rebellious states—the Emancipation Proclamation. "Decisive and extreme measures must be adopted," Lincoln told members of his cabinet, according to Secretary of the Navy Gideon Welles. Emancipation was "a military necessity, absolutely necessary to the preservation of the Union. We must free the slaves or be ourselves subdued."

By trying to convert a Confederate resource to Union advantage, emancipation thus became a crucial part of the North's national strategy. But the idea of putting arms in the hands of black men provoked even greater hostility among Democrats and border state Unionists than emancipation itself. In August 1862, Lincoln told delegates from Indiana who offered to raise two black regiments that "the nation could not afford to lose Kentucky at this crisis" and that "to arm the negroes would turn 50,000 bayonets from the loyal border States against us that were for us."

Lincoln wanted the Army of the Potomac (below: in Virginia in 1862) to launch a pincer attack against Gen. Joseph Johnston's army, but McClellan rejected the plan, allowing Johnston to escape.

Three weeks later, however, the president quietly authorized the War Department to begin organizing black regiments on the South Carolina Sea Islands. And by March 1863, Lincoln had told his military governor of occupied Tennessee that "the colored population is the great *available* and yet *unavailed* of, force for restoring the Union. The bare sight of fifty thousand armed, and drilled black soldiers on the banks of the Mississippi, would end the rebellion at once. And who doubts that we can present that sight, if we but take hold in earnest."

This prediction proved overoptimistic. But in August 1863, after black regiments had proved their worth at Fort Wagner and elsewhere, Lincoln told opponents of their employment that in the future "there will be some black men who can remember that, with silent tongue, and clenched teeth, and steady eye, and well-poised bayonet, they have helped mankind on to this great consummation; while, I fear, there will be some white ones, unable to forget that, with malignant heart, and deceitful speech, they have strove to hinder it."

Lincoln also took a more active, hands-on part in shaping military strategy than presidents have done in most other wars. This was not necessarily by choice. Lincoln's lack of military training inclined him at first to defer to General in Chief Winfield Scott, America's most celebrated soldier since George Washington. But Scott's age (75 in 1861), poor health and lack of energy placed a greater burden on the president. Lincoln was also disillusioned by Scott's March 1861 advice to yield both Forts Sumter and Pickens. Scott's successor, Gen. George B. McClellan, proved an even greater disappointment to Lincoln.

In early December 1861, after McClellan had been commander of the Army of the Potomac for more than four months and had done little with it except conduct drills and reviews, Lincoln drew on his reading and discussions of military strategy to propose a campaign against Confederate Gen. Joseph E. Johnston's army, then occupying the Manas-

sas-Centreville sector 25 miles from Washington. Under Lincoln's plan, part of the Army of the Potomac would feign a frontal attack while the rest would use the Occoquan Valley to move up on the flank and rear of the enemy, cut its rail communications and catch it in a pincer movement.

It was a good plan; indeed it was precisely what Johnston most feared. McClellan rejected it in favor of a deeper flanking movement all the way south to Urbana on the Rappahannock River. Lincoln posed a series of questions to McClellan, asking him why his distant-flanking strategy was better than Lincoln's short-flanking plan. Three sound premises underlay Lincoln's questions: first, the enemy army, not Richmond, should be the objective; second, Lincoln's plan would enable the Army of the Potomac to operate near its own base (Alexandria) while McClellan's plan, even if successful, would draw the enemy back toward *his* base (Richmond) and lengthen the Union supply line; and third, "does not your plan involve a greatly larger expenditure of *time* . . . than mine?"

McClellan brushed off Lincoln's questions and proceeded with his own plan, bolstered by an 8–4 vote of his division commanders in favor of it, which caused Lincoln reluctantly to acquiesce. Johnston then threw a monkey wrench into McClellan's Urbana strategy by withdrawing from Manassas to the south bank of the Rappahannock—in large part to escape the kind of maneuver Lincoln had proposed. McClellan now shifted his campaign all the way to the Virginia peninsula between the York and James rivers. Instead of attacking a line held by fewer than 17,000 Confederates near Yorktown with his own army, then numbering 70,000, McClellan, in early April, settled down for a siege that would give Johnston time to bring his whole army down to the peninsula. An exasperated Lincoln telegraphed McClellan on April 6: "I think you better break the enemies' line from York-town to Warwick River, at once. They will probably use *time*, as advantageously as you can." McClellan's only response was to comment petulantly in a letter to his wife that "I was much tempted to reply that he had better come & do it himself."

In an April 9 letter to the general, Lincoln enunciated another major theme of his military strategy: the war could be won only by fighting the enemy rather than by endless maneuvers and sieges to occupy *places*. "Once more," wrote Lincoln, "let me tell you, it is indispensable to *you* that you strike a blow. You will do me the justice to remember I always insisted, that going down the Bay in search of a field, instead of fighting at or near Manassas, was only shifting, and not surmounting, a difficulty—that we would find the same, or equal intrenchments, at either place. The country will not fail to note—is now noting—that the present hesitation to move upon an intrenched enemy, is but the story of Manassas repeated."

But the general who acquired the nickname of Tardy George never learned that lesson. The same was true of several other generals who did not live up to Lincoln's expectations. They seemed to be paralyzed by responsibility for the lives of their men as well as the fate of their army and nation. This intimidating responsibility made them risk-averse. This behavior especially characterized commanders of the Army of the Potomac, who operated in the glare of media publicity with the government in Washington looking over their shoulders. In contrast, officers like Ulysses S. Grant, George H. Thomas and Philip H. Sheridan got their start in the western theater hundreds of miles distant, where they worked their way up from command of a regiment step by step to larger responsibilities away from media attention. They were able to grow into these responsibilities and to learn the necessity of taking risks without the fear of failure that paralyzed McClellan.

Meanwhile, Lincoln's frustration with the lack of activity in the Kentucky-Tennessee theater had elicited from him an important strategic concept. Generals Henry W. Halleck and Don C. Buell commanded in the two western theaters separated by the Cumberland River. Lincoln urged them to cooperate in a joint campaign against the Confederate army defending a line from eastern Kentucky to the Mississippi River. Both responded in early January 1862 that they were not yet ready. "To operate on *exterior* lines against an enemy occupying a central position will fail," wrote Halleck. "It is condemned by every military authority I have ever read." Halleck's reference to "exterior lines" described the conundrum of an invading or attacking army operating against an enemy that holds a defensive perimeter resembling a semi-circle—the enemy enjoys the advantage of "interior lines" that enables it to shift reinforcements from one place to another within that arc.

For more than four months, General McClellan had done little except conduct drills.

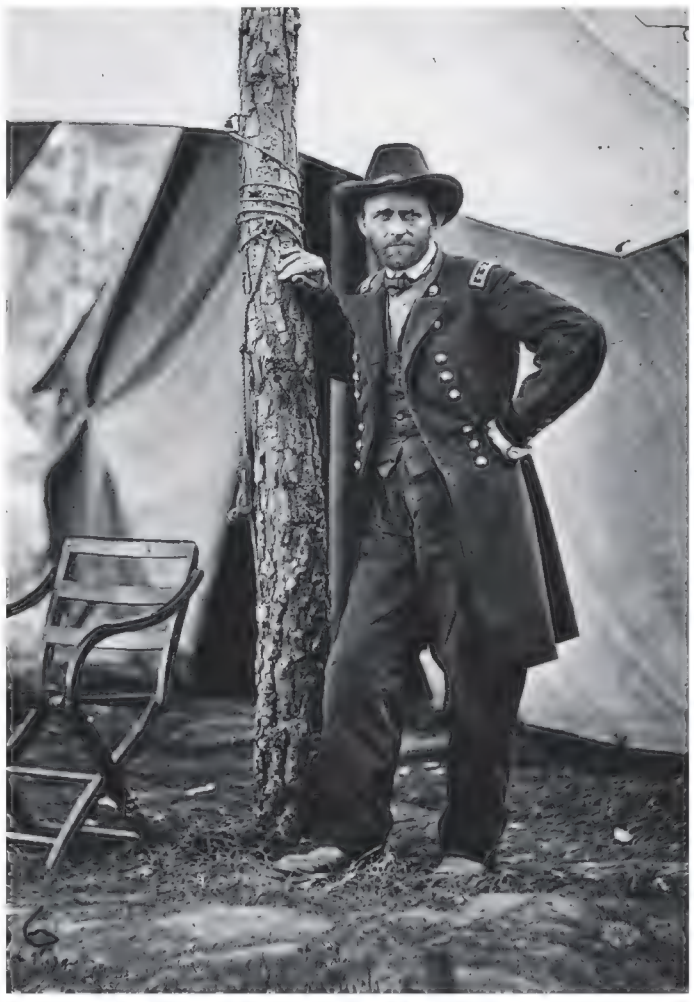
By this time Lincoln had read some of those authorities (including Halleck) and was prepared to challenge the general's reasoning. "I state my general idea of the war," he wrote to both Halleck and Buell, "that we have the *greater* numbers, and the enemy has the *greater* facility of concentrating forces upon points of collision; that we must fail, unless we can find some way to making *our* advantage an over-match for his; and that this can be only done by menacing him with superior forces at *different* points, at the *same* time; so that we can safely attack, one, or both, if he makes no change; and if he *weakens* one to strengthen the other, forbear to attack the strengthened one, but seize and hold the weakened one, gaining so much."

Lincoln clearly expressed here what military theorists

BETTMANN / CORBIS

define as "concentration in time" to counter the Confederacy's advantage of interior lines that enabled Southern forces to concentrate in space. The geography of the war required the North to operate generally on exterior lines while the Confederacy could use interior lines to shift troops to the point of danger. By advancing on two or more fronts simultaneously, Union forces could neutralize this advantage, as Lincoln understood but Halleck and Buell seemed unable to grasp.

Not until Grant became general in chief in 1864 did Lincoln have a commander in place who would carry out this strategy. Grant's policy of attacking the enemy wherever he found it also embraced Lincoln's strategy of trying to cripple the enemy as far from Richmond (or any other base) as possible rather than maneuvering to occupy or capture *places*. From February to June 1862, Union forces had enjoyed remarkable success in capturing Confederate territory and cities along the south Atlantic coast and in Tennessee and the lower Mississippi Valley, including the cities of Nashville, New Orleans and Memphis. But Confederate counteroffensives in the summer recaptured much of this territory (though not these cities). Clearly, the conquest and occupation of places would not win the war so long as enemy armies remained capable of reconquering them.



Lincoln viewed these Confederate offensives more as an opportunity than a threat. When the Army of Northern Virginia began to move north in the campaign that led to Gettysburg, Gen. Joseph Hooker proposed to cut in behind the advancing Confederate forces and attack Richmond. Lincoln rejected the idea. "*Lee's* Army, and not *Richmond*, is your true objective point," he wired Hooker on June 10, 1863. "If he comes toward the Upper Potomac, follow on his flank, and on the inside track, shortening your [supply] lines, whilst he lengthens his. Fight him when opportunity offers." A week later, as the enemy was entering Pennsylvania, Lincoln told Hooker that this invasion "gives you back the chance that I thought McClellan lost last fall" to cripple Lee's army far from its base. But Hooker, like McClellan, complained (falsely) that the enemy outnumbered him and failed to attack while Lee's army was strung out for many miles on the march.

Hooker's complaints compelled Lincoln to replace him on June 28 with George Gordon Meade, who punished but did not destroy Lee at Gettysburg. When the rising Potomac trapped Lee in Maryland, Lincoln urged Meade to close in for the kill. If Meade could "complete his work, so gloriously prosecuted thus far," said Lincoln, "by the literal or substantial destruction of Lee's army, the rebellion will be over."

Instead, Meade pursued the retreating Confederates slowly and tentatively, and failed to attack them before they managed to retreat safely over the Potomac on the night of July 13-14. Lincoln had been distressed by Meade's congratulatory order to his army on July 4, which closed with the words that the country now "looks to the army for greater efforts to drive from our soil every vestige of the presence of the invader." "Great God!" cried Lincoln. "This is a dreadful reminiscence of McClellan," who had proclaimed a great victory when the enemy retreated across the river after Antietam. "Will our Generals never get that idea out of their heads? The whole country is *our* soil." That, after all, was the point of the war.

When word came that Lee had escaped, Lincoln was both angry and depressed. He wrote to Meade: "My dear general, I do not believe you appreciate the magnitude of the misfortune involved in Lee's escape. . . . Your golden opportunity is gone, and I am distressed immeasurably because of it."

Having gotten these feelings off his chest, Lincoln filed the letter away unsent. But he never changed his mind. And two months later, when the Army of the Potomac was maneuvering and skirmishing again over the devastated land between Washington and Richmond, the president declared that "to attempt to fight the enemy back to his intrenchments in Richmond . . . is an idea I have been trying to repudiate for quite a year."

Five times in the war Lincoln tried to get his field commanders to trap enemy armies that were raiding or invading northward by cutting in south of them and blocking their routes of retreat: during Stonewall Jackson's drive north through the Shenandoah Valley in May 1862; Lee's invasion of Maryland in September 1862; Braxton Bragg's and Edmund Kirby Smith's invasions of Kentucky in the same month; Lee's invasion of Pennsylvania in the Gettysburg campaign; and Jubal Early's raid to the outskirts of Washington in July 1864. Each time his generals failed him, and in most cases they soon found themselves relieved of command.

In all of these instances the slowness of Union armies trying to intercept or pursue the enemy played a key part in their failures. Lincoln expressed repeated frustration with

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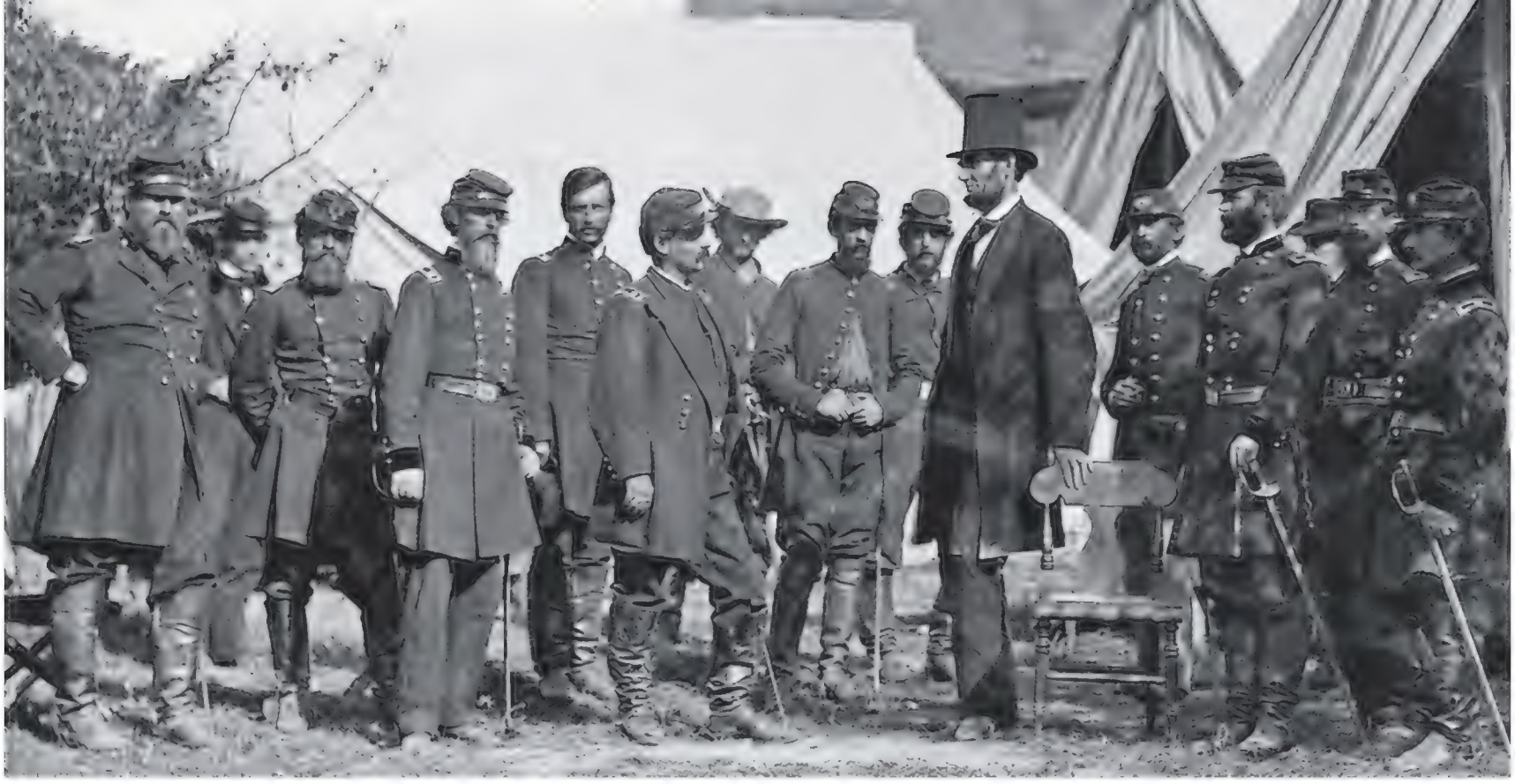


ALEXANDER GARDNER / LIBRARY OF CONGRESS

the inability of his armies to march as light and fast as Confederate armies. Much better supplied than the enemy, Union forces were actually slowed down by the abundance of their logistics. Most Union commanders never learned the lesson pronounced by Confederate Gen. Richard Ewell that "the road to glory cannot be followed with much baggage."

Lincoln's efforts to get his commanders to move faster with fewer supplies brought him into active participation at the operational level of his armies. In May 1862 he directed General Irvin McDowell to "put all possible energy and speed into the effort" to trap Jackson in the Shenandoah Valley. Lincoln probably did not fully appreciate the logistical difficulties of moving large bodies of troops, especially in enemy territory. On the other hand, the president did comprehend the reality expressed by the Army of the Potomac's quartermaster in response to McClellan's incessant requests for more supplies before he could advance after Antietam, that "an army will never move if it waits until all the different commanders report that they are ready and want no more supplies." Lincoln told another general in November 1862 that "this expanding, and piling up of *impedimenta*, has been, so far, almost our ruin, and will be our final ruin if it is not abandoned. . . . You would be better off. . . . for not having a thousand wagons, doing nothing but hauling forage to feed the animals that draw them, and taking at least two thousand men to care for the wagons and animals, who otherwise might be two thousand good soldiers."

With Grant and Sherman, Lincoln finally had top generals who followed Ewell's dictum about the road to glory and who were willing to demand of their soldiers—and of themselves—the same exertions and sacrifices that Confederate commanders required of theirs. After the 1863 Vicksburg campaign that captured a key stronghold in Mississippi, Lincoln said of General Grant—whose rapid mobility and absence of a cumbersome supply line were a key to its success—that "Grant is my man and I am his the rest of the war!"

Lincoln had opinions about battlefield tactics, but he rarely made suggestions to his field commanders for that level of operations. One exception, however, occurred in the second week of May 1862. Upset by McClellan's monthlong siege of Yorktown without any apparent result, Lincoln and Secretary of War Stanton and Secretary of the Treasury Salmon P. Chase sailed down to Hampton Roads on May 5 to discover that the Confederates had evacuated Yorktown before McClellan could open with his siege artillery.

Victories by Ulysses S. Grant (left: c. 1864) led Lincoln to say, "Grant is my man and I am his the rest of the war!" Lincoln (above: with officers in 1862) rarely dictated battlefield tactics.

Norfolk remained in enemy hands, however, and the feared CSS *Virginia* (formerly the *Merrimack*) was still docked there. On May 7, Lincoln took direct operational control of a drive to capture Norfolk and to push a gunboat fleet up the James River. The president ordered Gen. John Wool, commander at Fort Monroe, to land troops on the south bank of Hampton Roads. Lincoln even personally carried out a reconnaissance to select the best landing place. On May 9, the Confederates evacuated Norfolk before Northern soldiers could get there. Two days later the *Virginia*'s crew blew her up to prevent her capture. Chase rarely found opportunities to praise Lincoln, but on this occasion he wrote to his daughter: "So has ended a brilliant week's campaign of the President; for I think it quite certain that if he had not come down, Norfolk would still have been in possession of the enemy, and the 'Merrimac' as grim and defiant and as much a terror as ever. . . . The whole coast is now virtually ours."

Chase exaggerated, for the Confederates would have had to abandon Norfolk to avoid being cut off when Johnston's army retreated up the north side of the James River. But Chase's words can perhaps be applied to Lincoln's performance as commander in chief in the war as a whole. He enunciated a clear national policy, and through trial and error evolved national and military strategies to achieve it. The nation did not perish from the earth but experienced a new birth of freedom.

Dangling from a paraglider with a propeller on his back, photographer George Steinmetz gets a new perspective on Africa **BY ABIGAIL TUCKER**

VROOM WITH A VIEW

Sculpted by the legendary harmattan wind, sandstone pinnacles in the Sahara were photographed by Steinmetz as he steered his motorized paraglider in northern Chad's Karnasai Valley near the Libya border. "Ironically, flying has brought me closer to the desert," he says, "as I am completely exposed to the forces of sun and wind that shape it."

WINGING IT

THE CHILDREN PLAYING AT THE ELEMENTARY SCHOOL across the street from George Steinmetz's house didn't miss a beat when, grunting in his driveway, he strapped on his flying machine. His outfit was pure New Jersey dad—loafers, blue jeans and a fleece vest—but his hair was wild and the shadows beneath his eyes were as dark as the volcanic craters he likes to photograph from the sky. Steinmetz had been up until 3 that morning dangling from the rafters of his garage to test his new motorized paragliding harness. "To be honest, it's a big pain," he said as his assistant, Jessica Licciardello, yanked at the engine's cord, checking it before we headed out for a test flight. "But, you see, I'm the only one who takes pictures like this."

The motor caught, and suddenly the clipped grass of Steinmetz's front yard rippled like the African savanna. Even now, the kids didn't look over: perhaps they mistook the roar for a leaf blower or lawn mower or some other source of suburban hubbub. It was just as well. Steinmetz's 6-year-old twin sons, students at the school, have never watched their father paraglide, and their mother would like to keep it that way. They have, however, seen the panoramic photographs their dad takes while hanging from a red parachute hundreds and sometimes thousands of feet off the ground—shots of sandstone pillars in Chad's Karnasai Valley, flamingos gliding over the Namibian coast and other seldom-seen-from-above wonders that fill *African Air*, Steinmetz's new book.

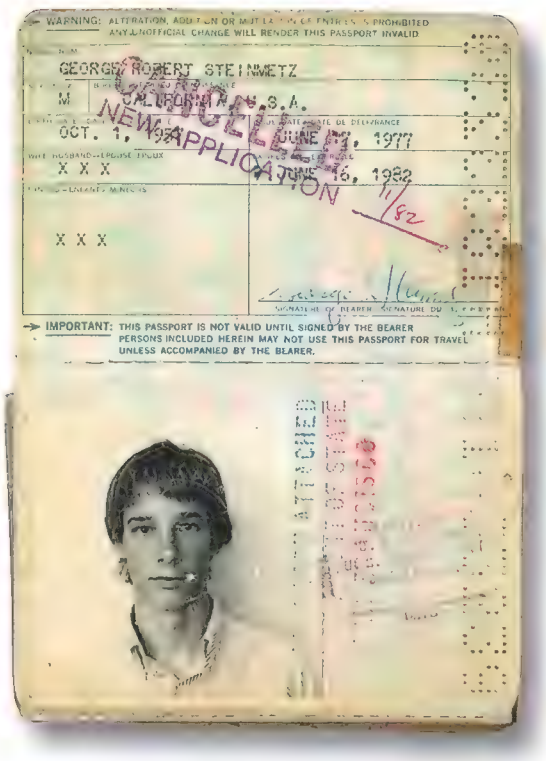
"Most aerial photographers work from helicopters or little planes, but he goes up on this crazy little thing," says Ruth Eichhorn, director of photography for the German edition of *GEO*, one of many magazines, including SMITHSONIAN, that has published Steinmetz's work. "He can go very low, so he can photograph people in the landscape, and he will go to places that nobody else will go. It's very, very dangerous work, but I think it's worth it."

Steinmetz's aircraft—he calls it "a flying lawn chair"—consists of a nylon paraglider, a harness and a backpack-mounted motor with a large propeller that looks like an industrial fan. "I am the fuselage," he explains. To lift off, he spreads the glider on the ground, cranks up the motor and runs a few steps when the right gust of wind comes along. Then, traveling 30 miles per hour, he can dip into craters and get close enough to thousands of sunbathing fur seals to smell their fishy breath.

It might be easy to dismiss him as a real-life Icarus, the winged rogue of Greek myth who soared too near the sun. But Steinmetz flies to get closer to the earth; his Africa pictures convey a kind of intimacy that comes only with a certain distance. His perspective is lofty but not detached, and it's informed by his love of geophysics, which he studied as an undergraduate at Stanford University. His aerial pictures trace human patterns, too, in the slums radiating from Cape Town, South Africa, for example, or the crowds at a Soweto cemetery assembled for Saturday morning funerals.

"Africa has always been instinctive for me," he said as we drove, with the paraglider in pieces in the back seat of his Suburban, to a tiny airport nearby. As a young man on hiatus from college in the late 1970s, Steinmetz hitchhiked around Africa for a year, generally horrifying his mother back home in Beverly Hills. In Sudan, he once rode—and slept—for three days on the curved roof of a moving train. Somewhere along the

To Africa: Steinmetz's 1977 passport.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HOMEWARD BOUND

In northern Botswana, a group of elephants, having eaten their fill of grass along the banks of the Linyanti River, heads to their stamping grounds in the brushland late one fall afternoon. Thanks to conservation measures, Botswana's elephants number more than 150,000—the largest population of the animals on the continent. But, Steinmetz says, they are increasingly coming into conflict with local farmers.

MAKING SALT THE ANCIENT WAY

Seen from the aircraft that Steinmetz calls his "flying lawn chair," a salt-making site at the village of Teguidda-n-Tessoumt in arid northern Niger appears to be a vast work of abstract art. The clay-lined pools hold briny water that slowly evaporates, yielding salt solids that workers truck to southern Niger and Nigeria, where the minerals are given to livestock. The bluish pools bear a salty crust that reflects the sky.

way, he learned to take pictures with a borrowed camera. Even then, he recalled, he fantasized about photographing the continent from above. "I wanted to get into that landscape," he said. "I wanted to see Africa in 3-D."

He worked as a photographer's assistant in California before he began publishing his own work. Then, in 1997, when he was planning to take aerial photographs of the Central Sahara, his bush pilot backed out. Steinmetz decided to learn to fly himself, taking lessons in motorized paragliding, which does not require a pilot's license, in an Arizona desert. A few months later, he was sailing above salt caravans in Niger. In the next decade he flew over some of the world's most forbidding places, a flamboyant red blip against the clouds.

He uses a digital camera, usually with a wide-angle zoom lens, and has to juggle the camera and the paraglider's Kevlar steering lines. He's had several nasty spills, including a recent crash into a stand of trees in northwest China; he awoke on the ground to discover that a tree branch had pierced his cheek. His contraption—at less than 100 pounds, the lightest kind of motorized aircraft in the world—can be carried just about anywhere: on a camel's back, in the belly of a canoe or in the back seat of an SUV.

Steinmetz: Seeing Africa in 3-D.

LEFT: ALEXIS PELTIER

Staff writer **ABIGAIL TUCKER** *last wrote about the 16th-century painter John White.*

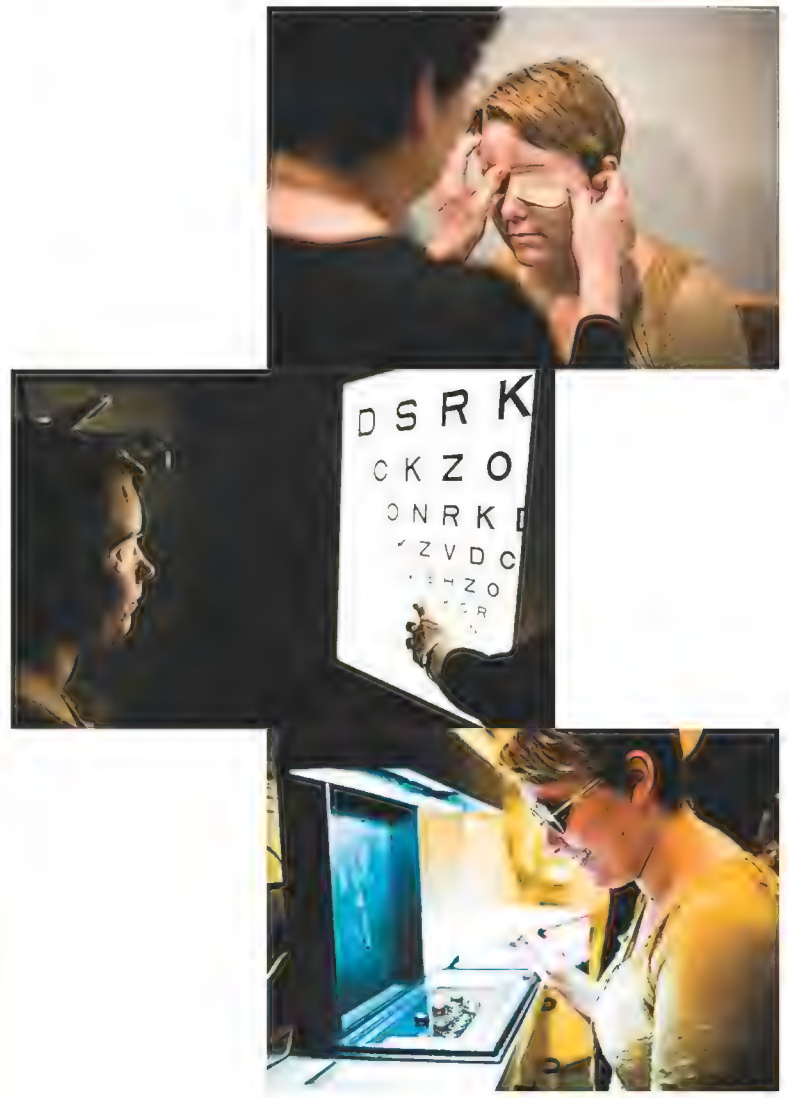
At the suburban airfield, Steinmetz pieced together the engine's flimsy-looking metal frame and donned a big white helmet, kneepads and his "wheels"—sturdy boots. This would be a test run for an assignment in Libya. His radio was on the fritz, but never mind: while airborne he would communicate with us on the ground through a series of kicks. Licciardello—who once upon a time thought she was taking an office job toning photographs—looked nervous. "OK, George," she said.

He spread the paraglider on the ground and waited for the wind.

CLOSE ENCOUNTERS

"The seals had been sunning on the beach in the late afternoon and taking a break from fishing in the cold waters of the Benguela current," Steinmetz says of his flight over a colony of Cape fur seals on Namibia's Skeleton Coast, named for its many whale remains and wrecked ships. It is said to be one of the world's least-visited places. "Flying only 50 feet above them I could smell their fishy breath and hear their doglike bark."

BORN WITH A DISEASE that has robbed her eyesight, Alisha Bacoccini (being examined by surgeon Albert Maguire) is undergoing experimental gene therapy at the University of Pennsylvania. If she weren't legally blind, says the 20-year-old massage therapist (opposite: testing after treatment), she would want to be a forensic scientist.



GENE THERAPY IN A NEW LIGHT

A husband-and-wife team's experimental genetic treatment for blindness is renewing hopes for a controversial field of medicine

BY JOCELYN KAISER

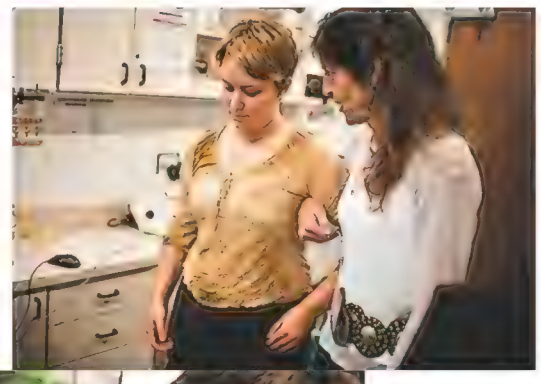
PHOTOGRAPHS BY STEPHEN VOSS

The small, windowless space at the Children's Hospital of Philadelphia looks like any eye doctor's examining room, with an adjustable chair and half a dozen machines for testing vision. The 20-year-old patient, however, has not come all the way from Albuquerque to get new glasses. Alisha Bacoccini, who has short, blond-streaked hair and green eyes, was born with a disorder caused by a malfunctioning gene in her retina cells that has been diminishing her sight since birth. Now she sees only pale and blurry shapes. "If I look at you I can't see eye color or acne or your eyebrows, but I can see that someone's there," she says. Her seeing eye dog, Tundra, a black Labrador retriever, sits at her feet.

A month earlier, in an experimental treatment, researchers injected Bacoccini's right eye—the worse one—with billions of working copies of the retinal cell gene. Now they'll find out if the treatment has worked.

Jean Bennett, a physician and molecular geneticist, has Bacoccini rest her forehead against a small white machine that flashes light into one eye, then the other. This pupillometer will indicate how well Bacoccini's eyes respond to light. "OK, one, two, three, open," Bennett says, and repeats the procedure 16 times. On a computer screen in the darkened room, Bacoccini's pupils are two giant black circles that contract ever so slightly with each pulse of light. Another researcher escorts Bacoccini to the next testing apparatus. Half an hour later, Bennett says: "I just looked at your pupillometry results. Good improvement."

"That's good," Bacoccini says, though she sounds unsure. Since a few days after the injection, she has indeed seen more light out of that eye, she says, but things seem blurrier. When she tries to read a giant eye chart with her right eye, she does no better than before—she can pick out only a few two-inch-high letters from 16 inches away. Then again, her eye is still red from the surgery. Bennett's husband, Albert Maguire, is the retinal surgeon who operated on Bacoccini. He peers into her eye and says the surface hasn't yet healed, adding: "Hopefully, that's all it is."



GENETICIST AND PHYSICIAN Jean Bennett (top: escorting Bacoccini at Children's Hospital) helped prove the experimental therapy worked by treating afflicted dogs (middle: with Venus, a once blind briard cured by the gene therapy). "She's a very happy dog," says Bennett (below: at Penn).

ONE PATIENT REGAINED ENOUGH SIGHT TO WALK THROUGH A MAZE. "I COULDN'T BELIEVE IT," BENNETT SAYS.

The prospect of using gene therapy to treat diseases—particularly inherited diseases that involve one errant gene, such as sickle cell anemia and cystic fibrosis—has tantalized scientists for decades. If there were some way to give a patient a good version of an implicated gene, the thinking goes, it might repair or prevent damage caused by the inherited bad one. This seemingly simple idea has turned out to be unexpectedly complex in practice. There have been hundreds of human gene-therapy trials for many diseases, from hemophilia to cancer, in the past 18 years. But nearly all failed because of the difficulties of getting a working gene into cells without also causing harmful side effects.

Until last year, gene therapy had worked unequivocally against only one disease, the rare affliction called severe combined immunodeficiency (SCID), which is caused by a flaw in any of a number of genes needed to produce white blood cells. The disease leaves the immune system unable to fight infections and usually leads to death in childhood. It is also called "bubble boy" disease, after one famous patient, David Vetter, who lived to age 12 in a sterile plastic bubble. Since the mid-1990s, European researchers have cured about 30 kids with SCID by inserting the appropriate functioning gene into their bone marrow. But even this success has been mixed with tragedy: five of the children developed leukemia and one has died. In those patients, who had a particular variant of the disease, the therapeutic gene accidentally turned on a cancer-causing gene after merging with the patients' DNA. Researchers are now testing ways to make gene therapy for SCID safer.

U.S. gene-therapy research was set back substantially after 18-year-old Jesse Gelsinger, who suffered from an inherited liver disease, died of multiple organ failure in 1999 while participating in a gene-therapy experiment at the University of Pennsylvania. News of the death prompted an uproar in the scientific community and hearings in Congress, with the teenager's father, Paul Gelsinger, and others accusing the Penn researchers of being too hasty to test the treatment in people.

ALL PHOTOS BY STEPHEN VOSS / WPN

BENNETT AND MAGUIRE first talked about DNA eye therapy in medical school more than 20 years ago. Can we fix the bad gene? he asked then. "That makes sense," she answered.

According to the Food and Drug Administration, the researchers had not sufficiently warned Gelsinger and his family of the experiment's risks. The lead researcher had also failed to disclose that he had a financial stake in a company that stood to gain if the treatment succeeded. "Those were the terrible days. The field bottomed out," says Leon Rosenberg, a Princeton University human geneticist, who performed early lab studies on the liver disease that Gelsinger had. "The integrity of science was damaged tremendously."

Bennett and Maguire joined the Penn medical school faculty in 1992. One of their colleagues is James Wilson, who oversaw the study in which Gelsinger died. Wilson was subsequently barred by the FDA from conducting human experiments. But Bennett and Maguire were not involved in that study. Their experimental gene-therapy trial began in 2007 after years of review by federal regulators, the Children's Hospital and Penn committees set up to address ethical and safety concerns raised by Gelsinger's death.

This past May, their team and a separate British group reported the first hopeful gene-therapy news in years: the technique could treat blindness. The patients in the study had a disease called Leber congenital amaurosis (LCA). The three patients whom Bennett and Maguire treated were able to read several more lines of an eye chart than they could before. One 26-year-old man even regained enough sight to walk through a maze. "I couldn't believe it," Bennett says. She made him walk the maze over again.

The study was small, and the patients are still legally blind, but their modest improvement and the apparent safety of the therapy have aroused the hopes of patients and researchers around the world. Now Bennett and Maguire are extending the research to more patients with LCA, including Bacoccini, to test whether patients can safely receive higher doses of the therapeutic gene.

Rosenberg says he is "delighted" for Bennett—who was a postdoctoral researcher in his lab in 1987—and the field. "I'm optimistic about gene therapy again and I haven't been for a while," he says. "Hopefully before the end of this decade there will be two or three other examples."

FOR BOTH BENNETT, 54, and Maguire, 48, science would appear to be in their genes. Bennett's mother, Frances, taught high-school literature and her father, William, was a popular physics professor at Yale who had co-invented the gas laser in 1960 while working at Bell Labs in New Jersey. Bennett remembers being 6 years old and seeing her father race back to the lab after dinner to work until dawn; the device later led to compact disc players and supermarket price scanners.

She was more interested in biology than physics. "I loved creatures," she says, and spent many happy hours looking through her father's microscope at swamp water and leaves. After college at Yale, she went to the University of California at Berkeley to earn a PhD in developmental biology, using sea urchins, but she was drawn instead to then new research on inserting specific, foreign genes into mice and other animals—a forerunner of gene therapy. She spent several months in 1981 and 1983 at the National Institutes of Health in Bethesda,

EIGHT-YEAR-OLD COREY HAAS of Hadley, New York (with parents Nancy and Ethan this past September), is among the youngest to receive the gene therapy for blindness. (Left: Maguire preps him for surgery.) Without treatment, Corey would become totally blind.

Maryland, in a lab where scientists were planning some of the first gene-therapy trials. "It was a glimmer that it was going to happen that got me excited. I wanted to be there as the field developed," Bennett recalls. To get the clinical background she needed, she went to Harvard Medical School, where she met her future husband in a first-year anatomy class.

Maguire also came from a family of scientists. His father, Henry, was a dermatologist and is now a cancer vaccine researcher at Penn, and his mother, Elise, worked there as a research assistant. Henry had cataracts and later retinal detachment. When Maguire was in high school, he administered his father's eyedrops—his earliest foray into ophthalmology treatment. In medical school, Maguire worked in a lab that studied retinal diseases caused by inherited gene defects. He remembers asking Bennett at the time if the bad genes could be fixed. "That makes sense," she told him. "Let's do it."

The eye is especially well suited to gene therapy. The cells into which a new gene must be inserted are limited to a small area; the retina contains only a few million cells. What's more, unlike most cells, retinal cells don't divide after a person is 3 months old, so researchers don't have to get the new gene into future generations of cells. That means they don't have to

stitch the new gene into the cells' existing DNA, which is replicated when a cell divides. Keeping the therapeutic gene separate from the patient's DNA is safer; in the SCID patients who developed leukemia, the introduced gene was incorporated near a cancer-causing gene and accidentally switched it on. The eye is also immunoprivileged, meaning the immune system tends to ignore foreign material introduced there. A runaway immune response has been a problem in some gene-therapy trials and is what killed Jesse Gelsinger. "We're very lucky with our choice of target organ," Maguire says.

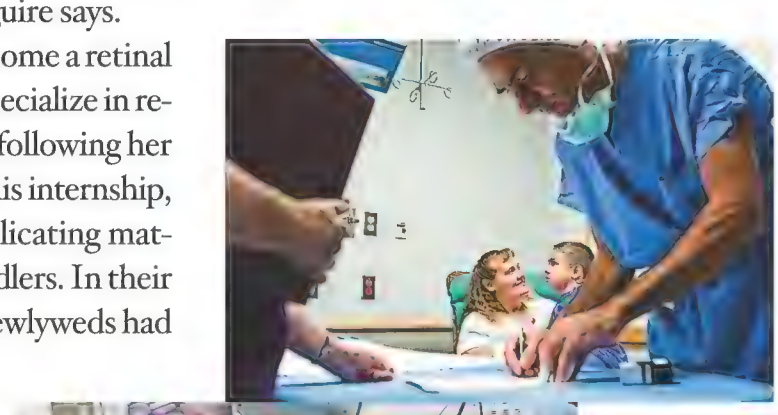
While Maguire trained to become a retinal surgeon, Bennett continued to specialize in research rather than clinical work, following her husband around the country for his internship, residency and fellowship. Complicating matters, they were traveling with toddlers. In their last year of medical school, the newlyweds had their first baby—"our senior project," they call it. Two more children soon followed.

In 1989, during one of Maguire's last training stops, in Royal Oaks, Michigan, Bennett set up makeshift labs in the building next door to the hospital and in the basement of their home. They conducted what they think was the first gene-therapy experiment involving the retina. Using mice and rabbits, they injected a gene for an enzyme found in bacteria. They used a dye to reveal whether the eye cells had built the enzyme, and the experiment succeeded: the animals' retinas turned blue for about two weeks.

At Penn, they published one of the first two papers showing that a virus endowed with a foreign gene could shuttle it into eye tissue, in this case in mice. (This strategy, common in gene-therapy experiments, essentially co-opts the virus' capacity to replicate by injecting its own genetic material into cells.) Bennett and Maguire later inserted therapeutic genes into the eyes of some Irish setters with inherited blindness. But Bennett thought the improvement in the dogs wasn't compelling enough to warrant a human trial. What they needed was a simple, slowly progressing form of blindness that was related to a disease that afflicts people. In 1998, they learned of a breed of briard dog in Sweden with an eye disease that, by a fluke, happened to be caused by one of the genetic mutations found in some patients with LCA.

About 3,000 people in the United States suffer from LCA, which encompasses several different blindness disorders that begin in childhood and are caused by mutations in any of several genes, one of which is called RPE65. It contains the instructions for an enzyme crucial to the retina's light-sensing cells, the rods and cones; the enzyme converts vitamin A into a form that the rods and cones use to make a necessary pigment, rhodopsin. In people who inherit a bad copy of the RPE65 gene from each parent, the rods and cones, deprived of rhodopsin, malfunction and eventually die.

Bennett, Maguire and co-workers used a virus called adeno-associated virus to insert a good copy of the RPE65 gene into three young briards. The AAV virus' two genes had been replaced with the RPE65 gene plus a string of DNA that switches the gene on. The dogs regained enough vision to navigate a maze. "It was fantastically exciting," Bennett says. One dog, Lancelot, became a kind of poster dog for gene therapy, shaking paws with people at press conferences and fundraisers.



TO TREAT COREY, Maguire (top) injected fluid containing good versions of the faulty gene into Corey's left eye (middle: projected onto a monitor). The procedure (bottom) led to improved vision within two months. He now has a wider field of vision and sees more color and light, says his father.

THE YOUNGER THE PATIENT, THE BETTER CHANCE BENNETT AND MAGUIRE HAVE OF REVERSING BLINDNESS CAUSED BY LCA.

On the sidewalk outside her office, Bennett shows off one of the more than 50 dogs they have treated. Venus, a medium-size briard with brown, wiry hair, strains at her leash and would clearly like to race away, but she sits to let a visitor pet her. "When she came here, she couldn't see a thing. She would crouch in a corner or in a cage baring her teeth at people," Bennett says. That was a year ago, before the Bennett/Maguire team treated the then 1-year-old in both eyes with gene therapy. Though still night blind, Venus can now hop over obstacles strewn along a corridor and catch a tennis ball. "Her behavior was transformed," Bennett says. "She's seeing well in both eyes. She's a very happy dog."

WHEN THEY FIRST TRIED the treatment in people, Bennett and Maguire didn't expect their patients to improve as much as the dogs. For one thing, the doctors were testing safety first and used low doses of the virus and gene. And their first patients, all from an eye clinic in Italy that tests blind patients for genetic defects, were 26-year-old twins and a 19-year-old. By that age, LCA patients don't have much

retinal tissue left. Most are completely blind by age 40.

Still, Bennett and Maguire didn't know what to expect when they treated the first patient, one of the twins. He was anesthetized, then Maguire made several small incisions and replaced the gel-like vitreous material in the man's eye with a salt solution so that Maguire could maneuver a needle through it more easily. Using a microscope, he threaded a hair-thin needle through the white of the eye until it touched the retina. He injected 150 microliters of a solution (a drop the size of a pea) that contained 15 billion copies of the AAV virus with the RPE65 gene. The virus is considered an extremely safe delivery mechanism—it can't replicate on its own, and it doesn't cause disease in humans.

All the same, that night "I didn't sleep at all," says Maguire, who was worried about an immune reaction. To his relief, there wasn't any.

Even though the dose was low, Bennett says the first time she looked at the young man's pupillometry data was "a Eureka moment"—his eye could sense more light. A few months after receiving the experimental therapy, all three patients were seeing more light. Two who could see only hand motions before could read three or four lines of an eye chart.

All three patients' eyesight is still improving, Bennett says. The 19-year-old, who has returned to Italy, no longer needs help to walk around at night.

BY VOLUNTEERING FOR THE STUDY, Corey (top: playing a video game) has a chance of reversing his vision loss and preventing blindness. Bacoccini (middle) says even if she doesn't regain sight, the information gleaned (bottom: syringes containing the genetic treatment) might benefit others.

WHEN ALISHA BACOCCINI WAS BORN, her mother, Eve Skidmore, could tell right away that something was wrong. Alisha seemed to focus only on bright light, like a window or lamp, Skidmore says. She thought her daughter might just need glasses, but the ophthalmologist said the little girl was going blind and nothing could be done. She was diagnosed with a progressive eye disease at 11 months, and a genetic test eventually identified the disease as LCA. As a child Alisha could still see well enough to play soccer with a white ball on green grass. "She was extremely fast," says Skidmore, which made up for not seeing the ball in the air. Around eighth grade, Alisha lost even that limited vision.

Today she can read text on a bright computer screen but not in a book. She works as a massage therapist. If she could see better, her dream job would be to work as a forensic pathologist—she devours Patricia Cornwell novels on tape. Skidmore wishes her daughter could regain enough sight "to see the stars in the sky and a rainbow, because she's never seen that."

"DOCTORS HAVE ALWAYS TOLD INHERITED BLINDNESS PATIENTS, THERE IS NOTHING WE CAN DO FOR YOU," SAYS MAGUIRE.

Bacoccini says she realizes that her sight may not improve in the gene-therapy study, and could even get worse. She volunteered to take part so she could "help to figure out how to fix blindness," she says.

Three months after Maguire injected Bacoccini's eyes with the viruses carrying the retinal gene, her eyes were ten times more sensitive to light and her peripheral vision had improved, but she could not read an eye chart any better than before. Bennett says there are several reasons the treatment may not be working well for her—for example, the neural circuits between Bacoccini's eye and brain may no longer function properly.

Bacoccini is part of a second phase of the study that gave three LCA patients a larger dose of gene therapy than the first three volunteers received. One of the other patients in Bacoccini's group is a 9-year-old Belgian boy, who has shown some of the most dramatic improvement yet. He can see details of faces for the first time and no longer needs a special magnifying device to see the chalkboard at school. The younger the patient, Bennett and Maguire believe, the better chance the couple has of reversing blindness caused by LCA. Eventually they hope to treat babies.

BIOMEDICAL RESEARCH OFTEN involves large teams of collaborators, but gene-therapy studies are an extreme case. Last year's paper in the *New England Journal of Medicine* announcing the initial success of gene therapy for blindness listed 32 co-authors, from the molecular biologists who designed the virus to the Italian doctors who found the patients. Bennett, the lead author, steers this group from a small office outside her laboratory. The space is crammed with notebooks and folders and decorated with thumbtacked photographs of her three kids, journal covers and a few pictures of Lancelot, now 8 years old and still seeing well.

Maguire claims that his role of giving patients injections is minor: "I just load the trucks." But he is, after all, one of the clinical experts. "With [inherited blindness] diseases, there's a huge emotional overlay," he says. "Doctors have always re-

garded them as incurable and told patients there is nothing we can do for you. The fact that this seems to be working is extremely exciting."

The success of the LCA trial has brought Bennett and Maguire a lot of attention—"an uncomfortable amount of attention," he says—including invitations from members of Congress to brief them on the work. But the duo seem to take it in stride. Bennett has been fielding a half-dozen phone calls and e-mails a day from blind patients or their parents who have heard about the LCA study. "I answer them all. All of these people are really, really upset about going blind or being blind," she says. To be sure, they are unlikely to fit into the LCA trial because they don't have the right genetic glitch. But she tells them to be tested for blindness genes anyway because a gene-therapy treatment for their disease may surface within a few years.

Soon Maguire and Bennett expect to begin experiments with Abyssinian cats with LCA caused by a gene mutation different from the one they've focused on so far. They're also planning a gene-therapy clinical trial for a form of Stargardt disease, or juvenile macular degeneration, which affects some 25,000 people in the United States and which they've successfully treated in mice engineered to have the disease. Now that it's been shown that gene therapy can be performed safely in the eye, companies are exploring ways to use the technique to treat diseases that aren't necessarily genetic in origin. For instance, introducing a gene that controls blood vessel growth might slow age-related macular degeneration, which afflicts more than ten million Americans.

"I'M OPTIMISTIC about gene therapy again and I haven't been for a while," one scientist says of the new blindness research (Bacoccini with her sister-in-law and guide dog).

Despite their high-flying medical successes, Bennett and Maguire drive to work in beat-up, ten-year-old cars. At home, she unwinds by gardening and playing her grandmother's grand piano, and he paints detailed, folk art-style farm scenes—rendering "every blade of grass," Bennett says. ("There's a little obsessive-compulsive disorder," Maguire explains about his hobbies.) Their youngest child has gone off to college, but they care for two dogs, an aquarium of fish and turtles and about 15 finches—Maguire's latest hobby is observing bird behavior. The family "has a high threshold for clutter," Maguire says.

Bennett stays up late at night writing reports and grant applications and planning more experiments. She is as driven as her father was when he worked on the gas laser. "There's this incredible excitement that you're about to break a barrier in something," she says.

JOCELYN KAISER *covers biomedical research and policy for* Science *magazine.* **STEPHEN VOSS** *recently photographed environmental degradation in China. Both live in Washington, D.C.*

View more images of this experimental gene therapy at Smithsonian.com/genetherapy

THE SPOTTED OWL'S *New Nemesis*

An epic battle between environmentalists and loggers left much of the bird's habitat protected. Now the celebrity species faces a new threat—a tougher owl

BY CRAIG WELCH *PHOTOGRAPHS BY GARY BRAASCH*

ERIC FORSMAN TRAMPED ACROSS the spongy ground with one ear tipped to the tangled branches above. We were circling an isolated Douglas fir and cedar stand near Mary's Peak, the highest point in Oregon's Coast Range, scouring the trees for a puff of tobacco-hued feathers. I had come to see one of the planet's most-studied birds—the Northern spotted owl—with the man who brought the animal to the world's attention.

Forsman stopped. "You hear it?" he asked. I didn't. Above the twitter of winter wrens I caught only the plunk of a creek running through hollow logs. Then Forsman nodded at a scraggly hemlock. Twenty feet off the ground, a cantaloupe-size spotted owl stared back at us. "It's the male," he whispered.

Before I could speak, Forsman was gone. The 61-year-old U.S. Forest Service biologist zipped down one fern-slippery hill and up another. For years, he'd explained, this bird and its mate pumped out babies like fertile field mice, producing more offspring than other spotted owls in the range. Forsman wanted to reach their nest to see if this year's eggs had hatched—and survived.

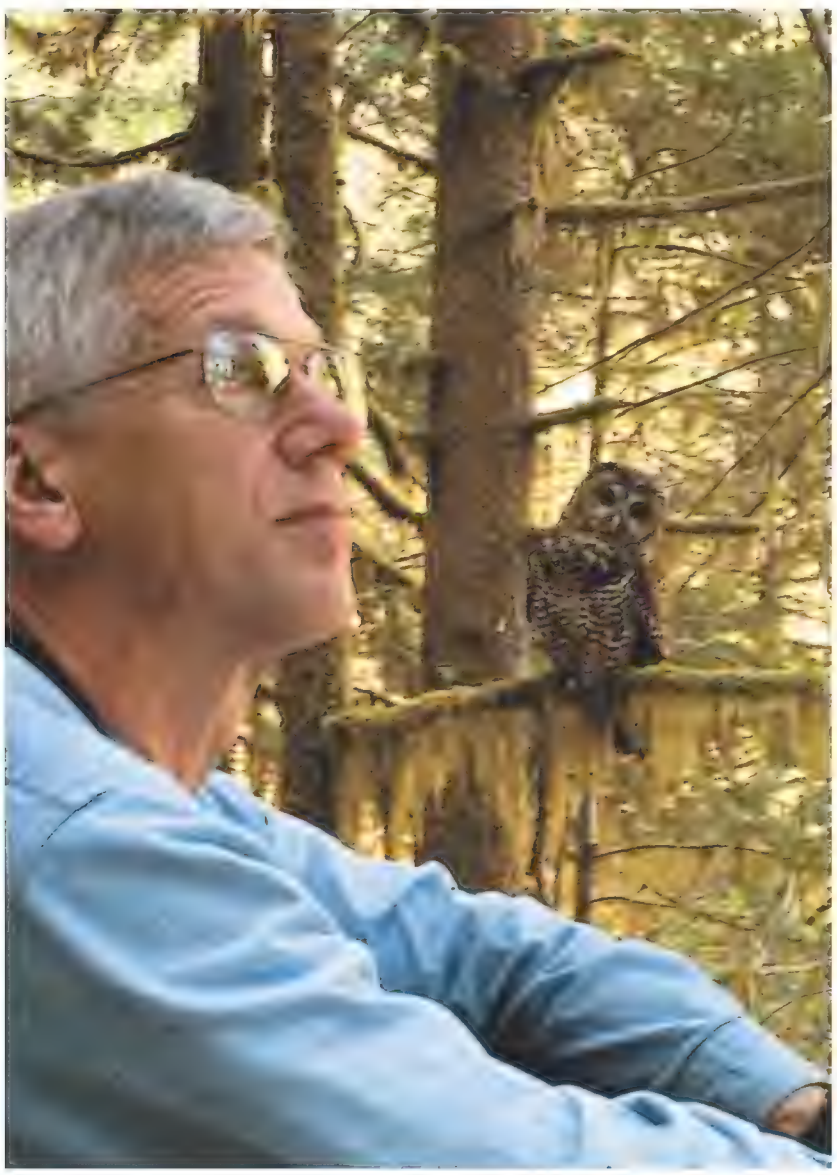
Every chick counts, because spotted owls are vanishing faster than ever. Nearly 20 years after Forsman's research helped the federal government boot loggers off millions of acres to save the threatened owls, nature has thrown the birds a curveball. A bigger, meaner bird—the barred owl—now drives spotted owls from their turf. Some scientists and wildlife managers have called for arming crews with decoys, shotguns and recorded bird songs in an experimental effort to lure barred owls from the trees and kill them.

To Forsman and other biologists, the bizarre turn is not a refutation of past decisions but a sign of the volatility to come for endangered species in an increasingly erratic world. As climate chaos disrupts migration patterns,

A 1991 court ruling helped the Northern spotted owl (in Oregon's Coast Range this past May) by sparing much of its old-growth forest habitat. Now what?

wind, weather, vegetation and river flows, unexpected conflicts will arise between species, confounding efforts to halt or slow extinctions. If the spotted owl is any guide, such conflicts could come on quickly, upend the way we save rare plants and animals, and create pressure to act before the science is clear. For spotted owls "we kind of put the blinders on and tried to only manage habitat, hoping things wouldn't get worse," Forsman said. "But over time the barred owl's influence became impossible to ignore."

When I finally hauled myself up to Forsman, yanking on roots for balance, I found him squatting on the ground looking at the curious female spotted owl. The bird, perched unblinking on a low branch not ten feet away, hooted a rising scale as if whistling through a slide flute. Her partner fluttered in and landed on a nearby branch.



Eric Forsman (with a wild spotted owl near Greasy Creek, Oregon) first warned decades ago that logging posed a threat to the highly endangered bird. He's not sure how to solve its latest problem.

Both creatures stared intently at Forsman, who absently picked at a clump of fur and rodent bones—an owl pellet regurgitated by one of the birds. Moments later the female launched herself to a tree crevice some 40 feet off the ground. Her head bobbed as she picked at her nest. Over the next hour, we looked through binoculars hoping to spy a chick.

IT WAS HERE, NOT HALF A MILE AWAY, above a trickle of runoff called Greasy Creek, that Forsman saw his first spotted owl nest in 1970. He had grown up chasing great horned owls in the woods outside an old strawberry farm near Eugene, and as an undergraduate at Oregon State University he prowled the forests in search of rare breeds. One day he shimmied up a tree and poked his head inside a crack. He escaped with brutal talon marks on his cheek and one of the earliest recorded glimpses of a spotted owl nest. He also scooped up a sick chick—its eyes were crusted shut—planning to nurse it back to health and return it to its nest. When he came back, though, the adult birds had vanished, so Forsman raised the baby bird himself. It lived in a cage outside his home for 31 years.

Drawn by the romance of this obscure creature that hides in dark woods, Forsman became a spotted owl expert. He was the first to note that the birds nest primarily in the cavities of ancient trees or in the broken-limbed canopies of old-growth forests, where they feast on wood rats, red tree voles, flying squirrels and deer mice. Logging of the Pacific Northwest's conifers accelerated during the post-World War II housing boom and continued afterward. Forsman and a colleague, biologist Richard Reynolds, warned Congress and the U.S. Forest Service that shrinking forests threatened the owl's existence. They sent one of their first letters, to then-Senator Bob Packwood of Oregon, in 1973.

The owl population crash finally began in the 1980s, about the time the environmental movement was finding its footing. In an effort to save what remained of the old-growth forests the birds needed to survive, radical environmentalists pounded steel or ceramic spikes into firs, which threatened to destroy chain saws and mill blades. They donned tree costumes to attract attention to their cause and crawled into tree platforms to disrupt logging. Counter-protests erupted. In angry mill towns, café owners provocatively served "spotted owl soup" and shops sold T-shirts and bumper stickers ("Save a Logger, Eat an Owl"). There were lawsuits, and, in 1990, the Northern subspecies of spotted owl came under the Endangered Species Act (two subspecies in other parts of the country were not affected). A sweeping federal court ruling in 1991 closed much of the Northwest woods to logging. By the end of the century, timber harvest on 24 million acres of federal land had dropped 90 percent from its heyday. The spotted owl crystallized the power of the species-protection law. No threatened animal has done more to change how we use land.

Yet the protection would prove insufficient. Throughout their range, from Canada to California, Northern spotted owls are disappearing three times faster than biologists had feared. Populations in parts of Washington are half what they were in the 1980s. So few birds remain in British Columbia

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CRAIG WELCH *lives in Seattle and is writing a book about wildlife thieves.* **GARY BRAASCH***'s most recent book is* Earth Under Fire: How Global Warming is Changing the World.

that the provincial government plans to cage the last 16 known wild spotted owls and try to breed them in captivity. "In certain parts of its range," says Dominick DellaSala, chief scientist of the National Center for Conservation Science & Policy, "the spotted owl is circling the drain."

BARRED OWLS, MEANWHILE, are thriving. Farther south in the Oregon woods, I crunched through dead leaves behind Robert Anthony, a U.S. Geological Survey biologist, and David Wiens, a wildlife science graduate student at Oregon State. Wiens swept an antenna through the forest, weaving it in and out of snarled branches below overcast skies. Within minutes he pulled up short. The source of his signal looked down from upslope—a barred owl. He'd outfitted the bird with a transmitter the year before.

Half a dozen years earlier, Wiens whispered, spotted owls occupied this patch of forest. "Then barred owls were found and they've kind of taken over," he said. Spotted owls have not been seen here since.

Most of the evidence that barred owls are harming spotted owls is circumstantial; that's why Wiens and other researchers traipse the woods daily, studying how the two species fight for space and food. Still, the trend is clear. Rocky Gutiérrez, a University of Minnesota wildlife biologist, wrote in 2006 that "despite the paucity of information, many biologists now feel that the barred owl is the most serious current threat to the spotted owl."

Both barred and spotted owls, along with great gray owls and rufous-legged owls, belong to the genus *Strix*, medium-sized birds that lack the hornlike tufts of ear feathers com-

Larger than its spotted cousin, the rival barred owl (far right: in Oregon this past spring) once lived only in eastern North America but greatly expanded its range over the 20th century (map). It has now colonized the Pacific Northwest, invading the habitat of the Northern spotted owl subspecies. Researchers are studying what happens when barred owls arrive in a forest (below: David Wiens tracks one outfitted with a radio transmitter in Buck Creek, Oregon). The early word doesn't bode well: so far, when barred owls move in, spotted owls disappear.

MAP: JOHN TOMANIO

mon to many other owls. They are so closely related that they sometimes crossbreed, blurring species boundaries and diluting spotted owl genes. More often, though, when barred owls move in, spotted owls just disappear.

Where spotted owls are finicky eaters, barred owls consume almost anything, including spotted owls. Barred owls, typically 20 percent larger than their rivals, may take over spotted owl nests or slam into their breasts like feathery missiles. "The barred owl is the new bully on the block," DellaSala says. A few years ago, a naturalist in Redwood National Park observed the aftermath of a murderous encounter: a barred owl with a tuft of mottled feathers clinging to its talons flapping near a decapitated, partially gnawed spotted owl. When scientists dissected the spotted owl's body, they saw that it had been sliced and perforated, as if by talons.

No one knows precisely why the bigger birds came West. Barred owls originally ranged from Florida to Maine and west to the treeless expanse of the Great Plains. Sometime in the 20th century, the birds skipped west, possibly across Canada. Perhaps they followed settlers who suppressed fire, allowing trees to grow and providing nesting pockets. Some scientists blame the influx of barred owls on climate change; a few suggest it's a natural range expansion. In 1990, barred owls in a forest west of Corvallis, Oregon, occupied less than 2 percent of spotted owl sites; today, barred owls nest in 50 percent of them. Barred owls have yet to saturate Oregon and California, but in a part of Washington's Gifford Pinchot National Forest set aside for the smaller bird, barred owl nests outnumber spotted owl sites by a third. When barred owls invaded the Olympic Peninsula, spotted owls moved to higher, steeper forests with smaller trees and less food—"like moving from the Sheraton to some dive motel," DellaSala says.

Regulations that halt logging in Northern spotted owl territory cover only federal lands. Private forest (above: owl habitat in the Oregon Coast Range destroyed in 2008) is largely exempt from such protections.

To count owls, which are nocturnal and hard to find, researchers do a lot of hooting; when the birds call back, biologists plunge into the forest toward the sound, usually at a sprint, stopping every so often to call out and listen again, the hoots echoing back and forth through the woods until human and bird wind up face to face. For spotted owls, the sound is vaguely like a cross between a muted rooster call and a French horn: "hoot-hootoot-hoo." For barred owls, the tone is similar but the call is longer and patterned differently: "hoot-hoot-wahoot, hoot-hoot wahoo." For a time, some researchers hoped that spotted owls were just clamming up around barred owls and there were actually more than they thought. But that hope has largely faded. "There's evidence that spotted owls decrease vocalizations in response to barred owls," says Forest Service biologist Stan Sovern. "But honestly, I don't think spotted owls can just be silent somewhere and stay there. Part of their natural history is calling back and forth to one another."

Predictably, perhaps, loggers, timber companies and politicians seized on the barred owls as evidence that logging wasn't to blame for the spotted owl's plight. They have called for a return of chain saws to federal woods, so far without success. But years of efforts by the Bush administration to jumpstart logging in the Pacific Northwest remain the subject of courtroom skirmishes between the timber industry, conservation groups and several federal agencies.

Yet far from saying that the logging restrictions were a mistake, owl biologists largely insist that more forests must

Biologist Eric Forsman was delighted that a breeding pair of wild spotted owls he has studied for years did it again (their 3-week-old hatchlings on a hemlock in Oregon this past May).

be spared, especially since heavy logging continues on state and private land. As Wiens and I peered across a timbered ridge, craning to see the barred owl's nest, Anthony said, "If you start cutting habitat for either bird, you just increase competitive pressure."

WHEN BARRED OWLS STARTED MOVING into spotted owl habitat, the U.S. Fish and Wildlife Service initially proposed killing hundreds of the invaders. After an outcry from scientists and the public, wildlife managers instead plan to launch smaller studies to see if culling barred owls prompts the spotted birds to return. Even proponents of the approach acknowledge that the idea raises a thorny question: When is it appropriate to kill one species to help another?

Scientists and wildlife officials have taken extreme measures when species collide. Government marksmen on the Columbia River below Bonneville Dam shoot rubber bullets and explode firecrackers to drive away sea lions fattening up on endangered salmon. Downriver, the U.S. Army Corps of Engineers has been relocating a colony of Caspian terns, which feast on endangered salmon and steelhead. In 2005, government contractors shot Arctic foxes outside Barrow, Alaska, to protect ground-nesting shorebirds. Not long ago, government-sponsored hunters in central Washington killed coyotes that preyed on the world's last remaining pygmy rabbits.

A scientist in California collecting museum specimens recently shot a few barred owls near abandoned spotted owl nests. Two weeks later, a spotted owl returned to the area. "He flew up, sat in the branch and was sitting there, like, 'Where's my mouse?'" says Kent Livezey, a wildlife biologist with the Fish and Wildlife Service and a member of the scientific work group trying to design barred owl control experiments. "He'd been hanging around."

Joe Buchanan, a biologist at Washington's Department of Fish and Wildlife, advocates targeted hunts if the evidence indicates that culling barred owls creates havens for spotted owls. But he acknowledges there are limits: "We can't push barred owls back to the Mississippi River."

Forsman supports shooting barred owls only to determine a cause-effect relationship between the two birds. Anything beyond that strikes him as impractical. "You could shoot barred owls until you're blue in the face," he said. "But unless you're willing to do it forever, it's just not going to work."

IT WOULD BE SEVERAL WEEKS before Forsman could tell for certain, to his delight, that the pair of spotted owls near Greasy Creek had again defied the odds and reared two young hatchlings. Yet Forsman isn't sanguine about the spotted owl's chances, particularly in northern areas like the Olympic Peninsula, where the barred owl concentration is high. "Whether barred owls will completely replace spotted owls . . . it's not clear," he says. "I would say the most optimistic view is that at some point we'll end up with a population that's largely barred owls, with a few scattered pairs of spotted owls."

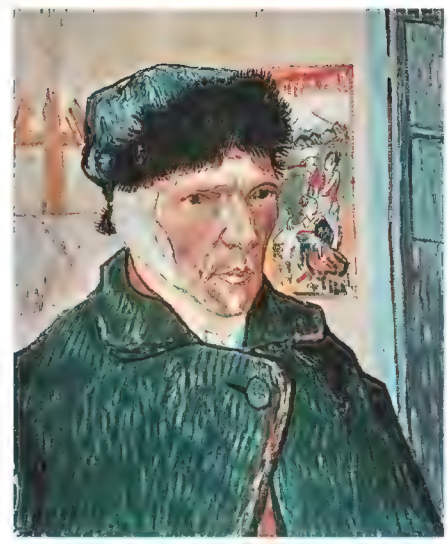
Yet after nearly four decades of tracking these birds, Forsman won't discount nature's capacity to surprise again. "No one really knows how this will play out in the long run," he says. Some elements of life in these ancient moss-draped forests remain shrouded in mystery.

See more spotted owl photographs at Smithsonian.com/spottedowl

NIGHT

"Imagination . . . enables us to create a more exalting and consoling nature than what just a glance at reality . . . allows us to perceive," van Gogh (far right: in an 1889 self-portrait) wrote to the artist Émile Bernard in 1888. "A starry sky, for example, well—it's a thing that I'd like to try to do." Later that year, he painted *The Starry Night over the Rhône.*

VISIONS



For Vincent van Gogh, fantasy and reality merged after dark in some of his most enduring works, as a new exhibition reminds us

BY PAUL TRACHTMAN

With his bright sunflowers, searing wheat fields and blazing yellow skies, Vincent van Gogh was fanatic about light. "Oh! that beautiful mid-summer sun here," he wrote to the painter Émile Bernard in 1888 from the south of France. "It beats down on one's head, and I haven't the slightest doubt that it makes one crazy. But as I was so to begin with, I only enjoy it."

Van Gogh was also enthralled with night, as he wrote to his brother Theo that same year: "It often seems to me that the night is much more alive and richly colored than the day. . . . The problem of painting night scenes and effects on the spot and actually by night interests me enormously."

What van Gogh fixed on, by daylight or at night, gave the world many of its most treasured paintings. His 1888 *Sunflowers*, says critic Robert Hughes, "remains much the most popular still life in the history of art, the botanical answer to the *Mona Lisa*." And van Gogh's visionary landscape *The Starry Night* (p. 73),

done the next year, has long ranked as the most popular painting at New York City's Museum of Modern Art (MoMA). This inspired the museum, in collaboration with Amsterdam's Van Gogh Museum, to mount the exhibition "Van Gogh and the Colors of the Night" (through January 5, 2009). It will then travel to the Van Gogh Museum (February 13-June 7, 2009).

"The van Gogh we usually think of, that painter of the most audacious, crazy, passionate, frenzied, unleashed bursts of brushwork, may be more evident in his daylight paintings," says MoMA's curator for the show, Joachim Pissarro, great-grandson of the French Impressionist Camille Pissarro. "But in paintings such as the Arles café at night, his touch is more restrained and you really see his intelligence at work. Despite all the mental anguish and depression he experienced, van Gogh never ceased to enjoy an astonishingly clear self-awareness and consciousness of what he was doing."

In an essay for the exhibition catalog, Pissarro tries to clear up some popular mythology: "Contrary to an enduring misconception of van Gogh as a rough and ready chromomaniac driven by his instincts to render what he saw almost as quickly as he saw it, the artist's twilight and night scenes are actually elaborate constructions that also call on his vast literary knowledge." Van Gogh himself hinted at this in a letter to his sister Wil, written in 1888 as he was painting his first starry night canvas. He was inspired, he said, by imagery in the poems by Walt Whitman he was reading: "He sees . . . under the great starlit vault of heaven a something which after all one can only call God—and eternity in its place above the world."

"Van Gogh was thinking about the night or the twilight his entire life," says curator Joachim Pissarro. The artist painted his melancholy *Lane of Poplars at Sunset* (right) in 1884, very early in his career. *The Cottage* (below) dates from 1885.

It seems that van Gogh never dreamed his paintings would become such fixed stars in the art firmament. In 1890, less than two months before he ended his life with a pistol shot, he wrote to a Paris newspaper critic who had praised his work, "It is *absolutely certain* that I shall never do important things." He was then 37 years old, had been painting for less than ten years and had sold next to nothing. In his last letter to Theo, found on the artist at his death, he had written: "Well, my own work, I am risking my life for it, and my reason has half foundered because of it."

Like his paintings, van Gogh's biography has gone into legend. He was born in 1853 in the Netherlands; his father was a minister, his uncles, successful art dealers. He was dismissed while working as a missionary in southwest Belgium

New Mexico-based painter and printmaker **PAUL TRACHTMAN** *wrote about new figurative painters in the October 2007 issue.*

VAN GOGH MUSEUM, AMSTERDAM; PP. 68-69 MUSÉE D'ORSAY, PARIS; P. 69 COURTAULD INSTITUTE GALLERIES, LONDON / ART RESOURCE, NY

PP. 70-71 KRÖLLER-MÜLLER MUSEUM, OTTERLO

for being too zealous and failed as an art salesman by being too honest. When he took up drawing and painting, his originality offended his teachers. One student later described the scene at the Antwerp Academy where van Gogh enrolled: "On that day the pupils had to paint two wrestlers, who were posed on the platform, stripped to the waist. Van Gogh started painting feverishly, furiously, with a rapidity that stupefied his fellow students. He laid on his paint so thickly that his colors literally dripped from his canvas on to the floor." He was promptly kicked out of the class.

"It often seems to me that the night is much more alive and richly colored than the day," van Gogh wrote to his brother Theo in 1888.

But alone in a studio or in the fields, van Gogh's discipline was as firm as his genius was unruly, and he taught himself all the elements of classical technique with painstaking thoroughness. He copied and recopied lessons from a standard academic treatise on drawing until he could draw like the old masters, before letting his own vision loose in paint. Although he knew he needed the utmost technical skill, he confessed to an artist friend that he aimed to paint with such "expressive force" that people would say, "I have *no* technique."

By the early 1880s, Theo, who was four years younger than Vincent, was finding success as a Paris art dealer and had begun supporting his brother with a monthly stipend. Vincent sent Theo his astonishing canvases, but Theo couldn't sell them. In the spring of 1889 after receiving a shipment of paintings that included the now-famous *Sunflowers*, the younger brother tried to reassure the elder: "When we see that the Pissarros, the Gauguins, the Renoirs, the Guillaumins do not sell, one ought to be almost glad of not having the public's favor, seeing that those who have it now will not have it forever, and it is quite possible that times will change very shortly." But time was running out.

Growing up in the Brabant, the southern region of the Netherlands, Vincent had absorbed the dark palette of great Dutch painters such as Frans Hals and Rembrandt. As an art student in Antwerp, he had the opportunity to visit museums, see the work of his contemporaries and frequent cafés and performances. In March 1886, he went to join Theo in Paris. There, having encountered young painters like Toulouse-Lautrec, Gauguin and Signac, as well as older artists such as Pissarro, Degas and Monet, he adopted the brighter colors of modern art. But with his move to Arles, in the south of France, in February 1888, the expressive force he'd been searching for at last erupted. Alone in the sun-drenched fields and gaslit night cafés of Arles, he found his own palette of bright yellows and somber blues, gay geranium oranges and soft lilacs. His skies became yellow, pink and green, with violet stripes. He painted feverishly, "quick as lightning," he boasted. And then, just as he achieved a new mastery over brush and pigment, he lost control of his life. In a fit of hallucinations and anguish in December 1888, he severed part of his ear and delivered it to a prostitute at a local brothel.

Gauguin, who had come to Arles to paint with him, fled to Paris, and van Gogh, after his neighbors petitioned the police, was locked up in a hospital. From then on, the fits recurred unpredictably, and he spent most of the last two years of his life in asylums, first in Arles and then in Saint-Rémy, painting what he could see through the bars of his window or from the surrounding gardens and fields. "Life passes like this," he wrote to Theo from Saint-Rémy in September 1889, "time does not return, but I am dead set on my work, for just this very reason, that I know the opportunities of working do not return. Especially in my case, in which a more violent attack may forever destroy my power to paint."

When the attacks seemed to subside in May 1890, van Gogh left Saint-Rémy for Auvers-sur-Oise, a small village near Paris where Dr. Paul Gachet, a local physician and friend to many painters, agreed to care for him. But van Gogh's paintings proved more successful than the doctor's treatments. Among the artist's last efforts was the tumultuous *Wheatfield with Crows*, in which dark and light, near and far, joy and anguish, all seem bound together in a frenzy of paint that can only be called apocalyptic. Van Gogh shot himself soon after painting it and died two days later. He was buried in a graveyard next to the field.

Theo had been at Vincent's side as the artist died and, according to Bernard, left the graveyard at Auvers "broken by grief." He never recovered. He barely had time to present a show of Vincent's paintings in his Paris apartment. Six months later he, too, died—out of his mind and incoherent in a clinic in Holland, where he had been taken by his wife because of his increasingly violent outbursts. (One theory

holds that both Theo and Vincent, and probably their sister Wil, all suffered from an inherited metabolic disorder that caused their similar physical and mental symptoms.) He now lies buried next to his brother in Auvers.

Against the backdrop of this poignant biography, the new exhibition of van Gogh's night pictures at MoMA takes on added significance. For it was to the night sky, and to the stars, that van Gogh often looked for solace. The problems of painting night scenes on the spot held more than a technical interest and challenge for him. When he looked at the night sky, he wrote to Theo in August 1888, he saw "the mysterious brightness of a pale star in the infinite." When you are well, he went on, "you must be able to live on a piece of bread while you are working all day, and have enough strength to smoke and drink your glass in the evening. . . . And all the same to feel the stars and the infinite high and clear above you. Then life is almost enchanted after all."

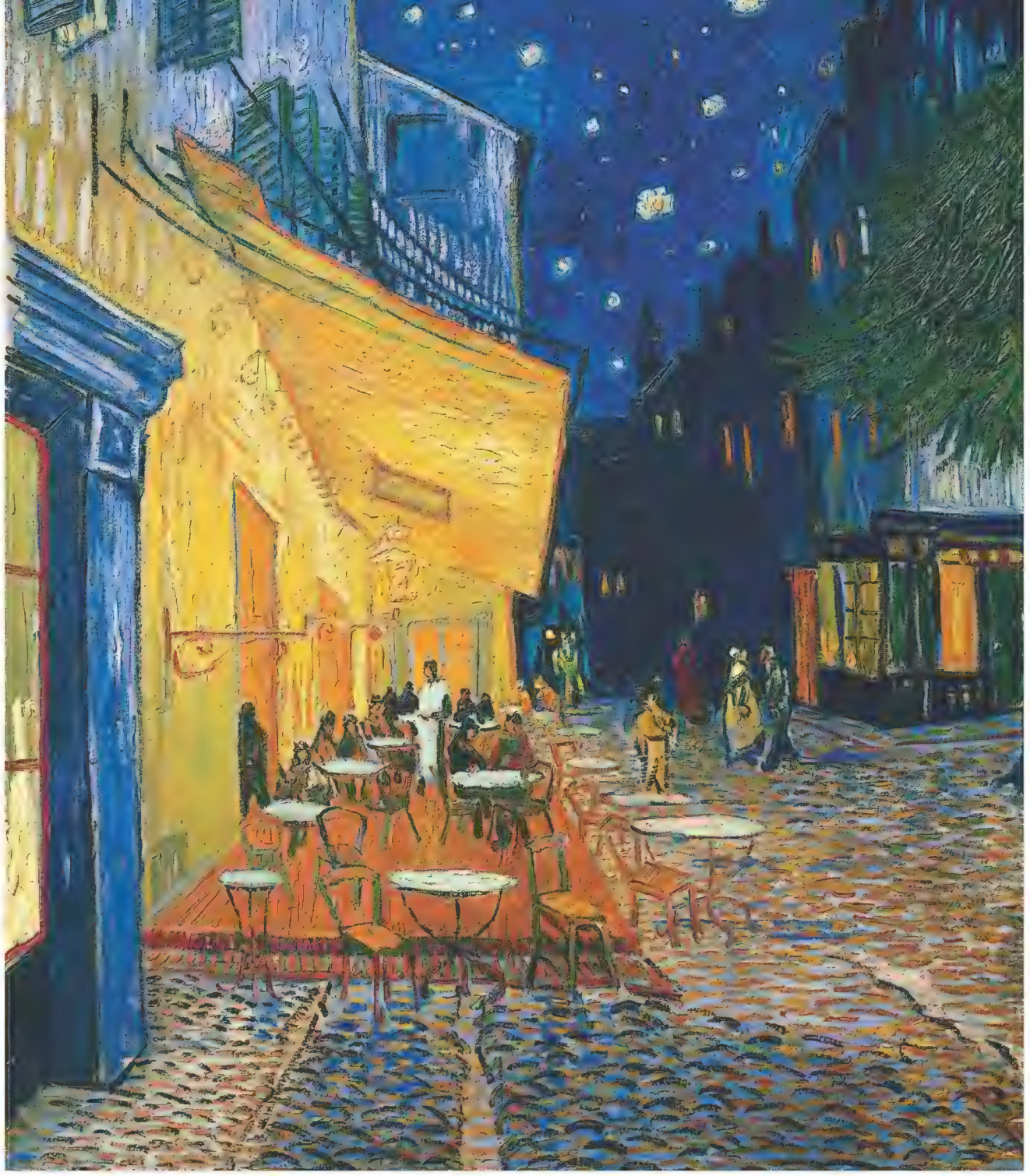
Van Gogh saw the night as a period of reflection and meditation after a day of activity, says MoMA curatorial assistant Jennifer Field, one of the organizers of the exhibition. "It was also this kind of metaphor for the cycle of life. And he linked this with the changing of the seasons."

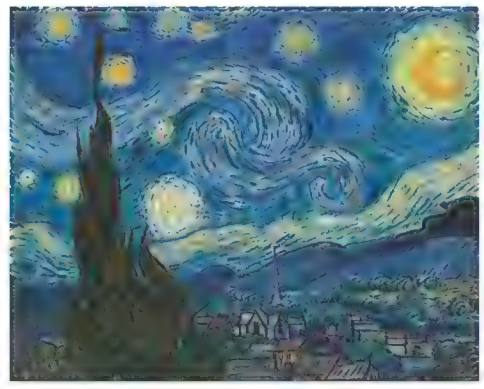
In Arles, in 1888 and 1889, van Gogh's paintings took on a mystical, dreamlike quality. Straight lines became wavy, colors intensified, thick paint became thicker, sometimes squeezed straight onto the canvas from the tube. Some of these changes were later taken as a sign of his madness, and even van Gogh feared that "some of my pictures certainly show traces of having been painted by a sick man." But there was premeditation and technique behind these distortions, as he tried to put a sense of life's mysteries into paint. In a letter to Wil, he explained that "the bizarre lines, purposely selected and multiplied, meandering all through the picture, may fail to give the garden a vulgar resemblance, but may present it to our minds as seen in a dream, depicting its character, and at the same time stranger than it is in reality."

"I have tried to express the terrible passions of humanity by means of red and green," Van Gogh wrote about his 1888 painting *The Night Café* (above). Later that year, he set his easel up outside under the gas lamps in Arles to paint *Terrace of a Café at Night* (above right).

The artist's focus on the relationship between dreams and reality—and life and death—had a profound meaning for him, as he had confided to Theo in a letter a year before his first crisis in Arles. "Looking at the stars always makes me dream, as simply as I dream over the black dots repre-

YALE UNIVERSITY ART GALLERY, NEW HAVEN





"He lived at night. . . . It was during the night hours that his experiments with imagination and memory went the farthest."

senting towns and villages on a map. Why, I ask myself, shouldn't the shining dots of the sky be as accessible as the black dots on the map of France? Just as we take the train to get to Tarascon or Rouen, we take death to reach a star."

His interest in mixing dreams and reality, observation and imagination, is particularly evident in the night paintings he made in Arles and Saint-Rémy in 1889 and 1890, in which he not only conquered the difficulties of using color to depict darkness but also went a long way toward capturing the spiritual and symbolic meanings that he saw in the night.

"He lived at night," says Pissarro. "He didn't sleep until three or four in the morning. He wrote, read, drank, went to see friends, spent entire nights in cafés . . . or meditated over the very rich associations that he saw in the night. It was during the night hours that his experiments with imagination and memory went the farthest."

Van Gogh told Theo that in depicting the interior of a night café (opposite), where he had slept among the night prowlers of Arles, "I have tried to express the terrible passions of humanity by means of red and green." He stayed up three consecutive nights to paint the "rotten joint," he said. "Everywhere there is a clash and contrast of the most disparate reds and greens in the figures of little sleeping hooligans, in the empty, dreary room . . . the blood-red and the yellow-green of the billiard table."

Van Gogh painted his iconic *The Starry Night* (above right) in 1889, while in an asylum in Saint-Rémy. "One of the most beautiful things by the painters of this century," he had written to Theo in April 1885, "has been the painting of DARKNESS that is still COLOR."

Van Gogh considered it one of the ugliest paintings he'd made, but also one of the most "real." His first painting of the starry sky, *The Starry Night over the Rhône* (1888), was another exercise in contrasting complementary colors (pairs chosen to heighten each other's impact). This time, the effect of the painting, with its greenish blue sky, violet-hued town and yellow gaslight, was more romantic. He wrote Wil that he had painted it "at night under a gas jet."

Van Gogh considered his now-iconic *The Starry Night*, which he painted from his barred window at Saint-Rémy, a failed attempt at abstraction. Before leaving Saint-Rémy, he wrote to Émile Bernard: "I have been slaving away on nature the whole year, hardly thinking of impressionism or of this, that and the other. And yet, once again I let myself go reaching for stars that are too big—a new failure—and I have had enough of it."

Theo liked the painting but was worried. He wrote Vincent that "the expression of your thoughts on nature and living creatures shows how strongly you are attached to them. But how your brain must have labored, and how you have risked everything. . . . " Vincent didn't live to know that in his reaching for the stars, he had created a masterpiece.

KRÖLLER-MÜLLER MUSEUM, OTTERLO / ART RESOURCE, NY; THE MUSEUM OF MODERN ART, NEW YORK

Explosives and giant machines are increasingly **destroying Appalachian peaks to obtain coal.** Opponents say the practice kills forests, threatens tourism and damages human health. One operation looms over a tiny West Virginia town, where residents and the industry are fighting over

MINING THE MOUNTAINS

BY JOHN MCQUAID

For most of its route through the hardscrabble towns of West Virginia's central Appalachian highlands, U.S. Highway 60 follows riverbanks and valleys. But as it approaches Gauley Mountain, it swoops dramatically upward, making switchbacks over steep wooded ridges. It goes by the Mystery Hole, a kitschy tourist stop that claims to defy the law of gravity. Then the road abruptly straightens and you're in Ansted, a town of about 1,600 people. There's an auto dealership, an Episcopal church and a Tudor's Biscuit World restaurant. A historical marker notes that Stonewall Jackson's mother is buried in the local cemetery, and there's a preserved antebellum mansion called Contentment.

The tranquillity belies Ansted's rough-and-tumble history as a coal town—and the conflict now dividing its townspeople. Founded as a mining camp in the 1870s by English

Brutal efficiency? Mountain operations (the 80-square-mile Hobet 21 mine near Danville, West Virginia, due to expand fivefold) yield one ton of coal for every 16 tons of terrain displaced.

geologist David T. Ansted, the first person to discover coal in the surrounding mountains, it played an important part in the Appalachian coal economy for nearly a century. The coal baron William Nelson Page made Ansted his headquarters. You get a feeling for the old connection to coal in the one-room town museum behind the storefront that serves as the town's city hall, with its vintage mining helmets and pickaxes, company scrip and photographs of dust-covered miners. But beginning in the 1950s, the boom ended, and one by one the mine shafts closed, leaving most of the local populace feeling bitter and abandoned.

"They burned the buildings down and left the area," Mayor R. A. "Pete" Hobbs recalled of the coal companies' abrupt departure. "Unemployment when I graduated high school"—in 1961—"was 27 percent."

Now coal is back, with a different approach: demolishing mountains instead of drilling into them, a method known as mountaintop coal removal. One project is dismantling the backside of Gauley Mountain, the town's signature topographical feature, methodically blasting it apart layer by layer and trucking off the coal to generate electricity and forge steel. Gauley is fast becoming a kind of Potemkin peak—whole on one side, hollowed out on the other. Some Ansted residents support the project, but in a twist of local history, many people, former miners included, oppose it, making the town an improbable battleground in the struggle to meet the nation's rising energy needs.

Since the mid-1990s, coal companies have pulverized Appalachian mountaintops in West Virginia, Kentucky, Virginia and Tennessee. Peaks formed hundreds of millions of years ago are obliterated in months. Forests that survived the last ice age are chopped down and burned. The Environmental Protection Agency estimates that by 2012, two decades of mountaintop removal will have destroyed or degraded 11.5 percent of the forests in those four states, an area larger than Delaware. Rubble and waste will have buried more than 1,000 miles of streams.

"They burned the buildings down and left the area," Mayor Hobbs recalls. "Unemployment when I graduated high school was 27 percent."

This is devastation on an astonishing scale, and though many of us would like to distance ourselves from it, blaming it on others' callousness or excesses, mountaintop coal removal feeds the global energy economy in which we all participate. Even as I was writing this article at home in suburban Washington, D.C., it occurred to me that the glowing letters on my laptop might be traceable to mountaintop removal. An EPA Web site (www.epa.gov/cleanenergy/energy-and-you/how-clean.html) indicates that utilities serving my ZIP code get 48 percent of their power from coal—as it happens, the same portion of coal-generated electricity nationwide. In fact, the environmental group Appalachian Voices produced a map indicating 11 direct connections between West Virginia mountaintop coal sources and electric power plants in my area, the closest being the Potomac River Generating Station in Alexandria, Virginia. So coal torn from a West Virginia mountain was put on a truck and then a rail car, which took it to Alexandria, where it was incinerated, creating the heat that drove the turbines that generated the electricity that enabled me to document concerns about the destruction of that very same American landscape.

Demand for mountaintop coal has been rising quickly, driven by high oil prices, energy-intensive lifestyles in the United States and elsewhere and hungry economies in China and India. The price of central Appalachian coal has nearly tripled since 2006 (the long-term effect on coal pricing of the latest global economic downturn isn't yet known). U.S. coal exports increased by 19 percent in 2007 and were expected to go up by 43 percent in 2008. Virginia-based Massey Energy, responsible for many of Appalachia's mountaintop projects, recently announced plans to sell more coal to China. As demand increases, so does mountaintop removal, the most efficient and most profitable form of coal mining. In West

PP. 74-75 PAUL CORBIT BROWN; PP. 76-77 ANTRIM CASKEY; P. 77 MAP: SAMUEL VELASCO, PEDRO VELASCO, 5W INFOGRAPHICS; PAUL CORBIT BROWN

West Virginia's $6 billion-a-year coal industry has roots in the town of Ansted (left: with Gauley Mountain behind it), founded as a mining camp in the 1870s. But Mayor Pete Hobbs (bottom: in his office) says the coal-removal operation atop the signature peak jeopardizes tourism hopes, including a proposed trail that would link parkland and national recreation areas. "The town has embraced that," he says. Still, some residents back the mine.

Virginia, mountaintop removal and other kinds of surface mining (including highwall mining, in which machines demolish mountainsides but leave peaks intact) accounted for about 42 percent of all coal extracted in 2007, up from 31 percent a decade earlier.

Whether demand for coal will grow or shrink in the Barack Obama administration remains to be seen; as a candidate, Obama backed investing in "clean coal" technology, which would capture air pollutants from burning coal—especially carbon dioxide, linked to global warming. But such technologies are still experimental, and some experts believe they are unworkable. Former Vice President Al Gore, writing in the *New York Times* after the November election, said the coal industry's promotion of "clean coal" was a "cynical and self-interested illusion."

"There are more kinds of organisms living in the southern Appalachians than in any other forest ecosystem in the world."

Biologist Ben Stout has shown that fallout from West Virginia mountaintop coal projects can harm forests, poisoning streams and stifling wildlife.

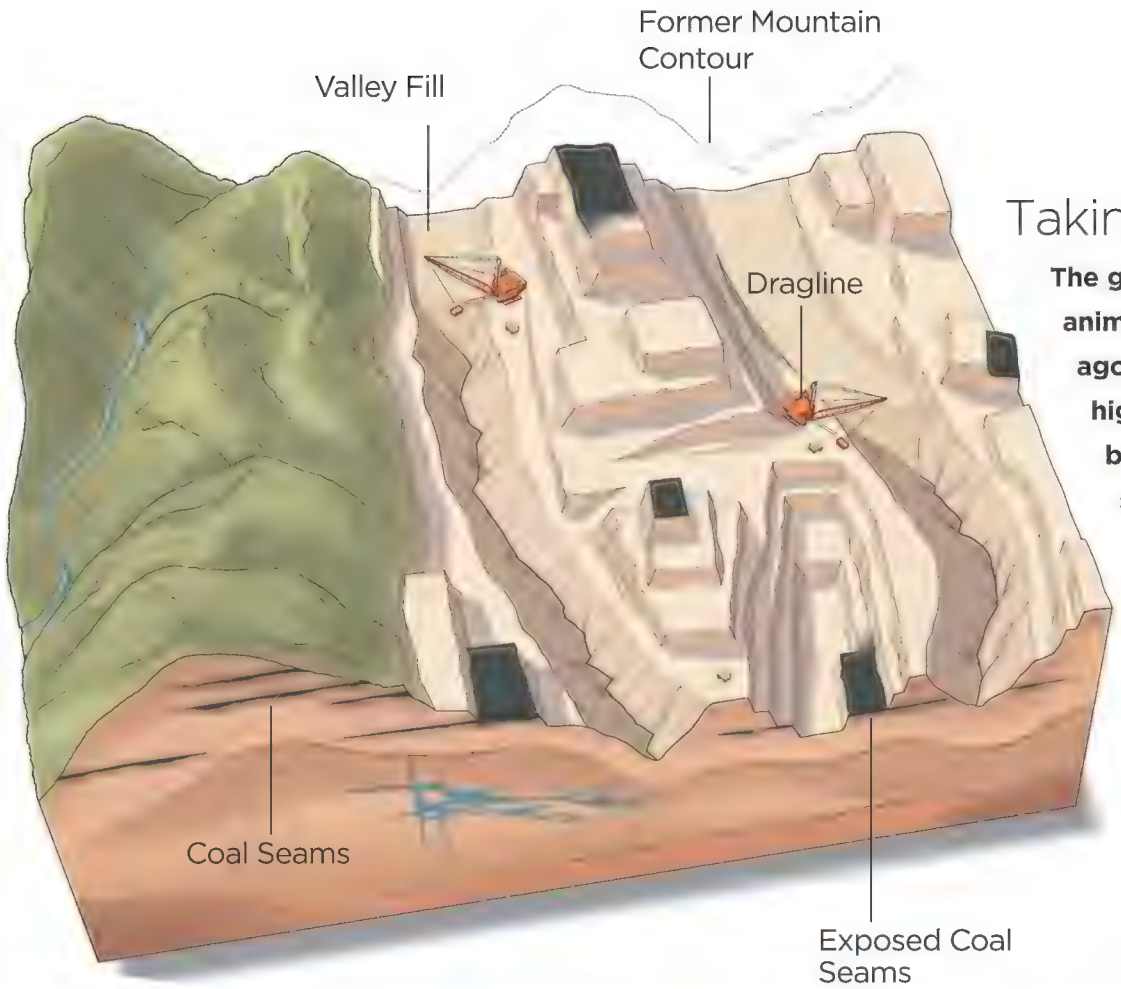
In Ansted, the conflict over mountaintop removal has taken on special urgency because it's about two competing visions for Appalachia's future: coal mining, West Virginia's most hallowed industry, and tourism, its most promising emerging business, which is growing at about three times the rate of the mining industry statewide. The town and its mining site lie between two National Park Service recreational areas, along the Gauley and New rivers, about ten miles apart. The New River Gorge Bridge, a span 900 feet above the water and perhaps West Virginia's best-known landmark, is just 11 miles by car from Ansted. Hawks Nest State Park is nearby. Rafting, camping—and, one day a year, parachuting from the New River Bridge—draw hundreds of thousands of people to the area annually.

Mayor Hobbs is Ansted's top tourism booster, a position he came to by a circuitous route. With no good prospects in town, he got a job in 1963 with C&P Telephone in Washington, D.C. Thirty years later, after a telecommunications career that took him to 40 states and various foreign countries, he returned to Ansted in one of AT&T's early work-from-home programs. He retired in 2000 and became mayor three years later, with ambitious tourism-development plans. "We're hoping to build a trail system to connect two national rivers together, and we'd be at the center of that—hunting, fishing, biking, hiking trails. The town has embraced that," Hobbs told me in his office, which is festooned with trail and park maps. What happens if the peak overlooking Ansted becomes even more of a mountaintop removal site? "A lot of this will be lost. 1961 is my reference point. [Coal companies] went away and left only a cloud of dust behind, and it's my fear that that's what will happen again with mountaintop removal."

FOLLOW ONE OF THE OLD mining roads toward the top of Ansted's 2,500-foot ridge and the picturesque view changes startlingly. Once the road passes the crest, the mountain becomes an industrial zone. On the day that I visited, countless felled trees were scattered across a slope stripped clear by bulldozers. Such timber is sometimes sold, but the trees are more often burned—a practice that amplifies coal's considerable impact on air pollution and global warming, both by generating carbon dioxide and by eliminating living trees, which absorb atmospheric carbon dioxide. Half a mile beyond that treeless slope, a mountain peak had been rendered like a carcass in a meat factory: its outermost rock layers had been blasted away, the remains dumped in nearby hollows, creating "valley fills." Heavy earth-moving equipment had scraped out the thin layers of coal. A broad outcropping of pale brown rock remained, scheduled for later demolition.

The scale of these projects is best appreciated from above, so I took a flight over the coal fields in a small plane provided by Southwings, a conservation-minded pilots' cooperative. The forest quickly gave way to one mining operation, then another—huge quarries scooped out of the hills. Some zones sprawl over dozens of square miles. Explosives were being set in one area. In another, diggers were scraping off layers of soil and rock—called "overburden"—on top of the coal. Trucks were carting rock and gravel to dump in adjacent valleys. Black, shimmering impoundments of sludge

ANTRIM CASKEY



Taking It From the Top

The geologic legacy of carbon-rich plants and animals that died in swamps 300 million years ago, thin coal seams lace many Appalachian highlands. Mining operations strip the forest, blast rocky soil with explosives and dig into seams with giant cranes called draglines. Valleys are filled with debris or dammed to hold wastewater. A peak may be reduced as much as 250 feet.

Some companies go to great lengths to "reclaim" mined sites (left: a Mingo County golf course), but critics say most efforts fall short. Artificial ponds filled with coal-processing residues (right: in Raleigh County) may leak, posing a risk to communities.

stretched along hillsides. Tanker trucks sprayed flattened hills with a mixture of grass seed and fertilizer, which would give rise to a sort of artificial prairie where forested peaks had been.

I've reported on devastation around the world—from natural disasters such as Hurricane Katrina, to wars in Central America and the Middle East, to coastlines in Asia degraded by fish farming. But in the sheer audacity of its destruction, mountaintop coal removal is the most shocking thing I've ever seen. Entering a mountaintop site is like crossing into a war zone. Another day, as I walked near a site on Kayford Mountain, about 20 miles southwest of Ansted, along a dirt road owned by a citizen who declined to lease to the mining companies, a thunderous boom rattled the ground. A plume of yellow smoke rose into the sky, spread out and settled over me, giving the bare trees and the chasm beyond the eerie cast of a battlefield.

To an outsider, the process may seem violent and wasteful, with a yield that can equal only about 1 ton of coal per 16 tons of overburden. But it's effective. "With mountaintop removal you're able to mine seams that you could not mine with underground mining because they are so thin—but it's a very high-quality coal," said Roger Horton, a truck driver and United Mine Workers Union representative who works at a mountaintop site in Logan, West Virginia. Mountaintop operations can mine seams less than two feet deep. "No human being could burrow into a hole 18 inches thick and extract the coal," Horton said. Typically, he adds, a project descends through seven seams across 250 vertical feet before reaching a layer of the especially high-grade coal that is used (because of the extreme heat it generates) in steel manufacturing. After that's collected, it's on to the next peak.

The Appalachian coal fields date back about 300 million

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ILLUSTRATION: SAMUEL VELASCO, PEDRO VELASCO, 5W INFOGRAPHICS; MELISSA FARLOW; ANTRIM CASKEY

years, when today's green highlands were tropical coastal swamps. Over the millennia, the swamps swallowed up massive amounts of organic material—trees and leafy plants, animal carcasses, insects. There, sealed off from the oxygen essential to decomposition, the material congealed into layers of peat. When the world's landmasses later collided in a series of mega-crashes, the coastal plain was pushed upward to become the Appalachians; after the greatest of these collisions, they reached as high as today's Himalayas, only to be eroded over the ages. The sustained geologic pressure and heat involved in creating the mountains baked and compressed the peat from those old bogs into seams of coal from a few inches to several feet thick.

First mined in the 19th century, Appalachian coal dominated the U.S. market for 100 years. But the game changed in the 1970s, when mining operations started in Wyoming's Powder River Basin, where coal seams are far thicker—up to 200 feet—and closer to the surface than anything in the East. It was in the West and Midwest where miners first employed some of the world's largest movable industrial equipment to scrape the earth. Behemoths called draglines can be more than 20 stories tall and use a scoop big enough to hold a dozen small cars. They are so heavy that no onboard power source could suffice—they tap directly into the electrical grid. Western mining operations achieved fantastic economies of scale, though Western coal has a lower energy content than Eastern coal and costs more to move to its principal customers, Midwestern and Eastern power plants.

"... You're able to mine seams that you could not mine with underground mining because they are so thin—but it's a very high-quality coal."

Then, in 1990, Eastern coal mining, long in decline, got a boost from an unlikely source: the Clean Air Act, revised that year to restrict sulfur dioxide emissions, the cause of acid rain. As it happens, central Appalachia's coal deposits are low in sulfur. Soon the draglines arrived in the East and coal mining's effect on the landscape took an ugly turn. To be sure, Wyoming's open-pit coal mines aren't pretty, but their location in a remote, arid basin has minimized the impact on people and wildlife. By contrast, coal seams in Appalachia require extensive digging for a smaller yield. The resulting debris is dumped into nearby valleys, effectively doubling the area of impact. More people live near the mines. And the surrounding forests are biologically dense—home to a surprising abundance and variety of life-forms.

"WE ARE SITTING IN THE MOST PRODUCTIVE and diverse temperate hardwood forest on the planet," said Ben Stout, a biologist at Wheeling Jesuit University, in West Virginia's northern panhandle. We were on a hillside a few miles from his office. "There are more kinds of organisms living in the southern Appalachians than in any other forest ecosystem in the world. We have more salamander species than any place on the planet. We have Neotropical migratory birds that come back here to rest and nest. They are flying back up here as they have over the eons. That relationship has evolved here because it's worth it to them to travel a couple of thousand miles to nest in this lush forest that can support their offspring in the next generation."

Stout has spent the past decade studying the effects of mining on ecosystems and communities. We waded into a chilly stream, about three feet across, that ran over stones and through clots of rotting leaves. He bent down and started pulling wet leaves apart, periodically flicking squirming bugs into a white plastic strainer he'd placed on a rock. Stoneflies were mating. A maggot tore through the layers of packed leaves. Other, smaller larvae were delicately peeling the outermost layer off one leaf at a time. This banquet, Stout said, is the first link in the food chain: "That's what drives this ecosystem. And what happens when you build a valley fill and bury this stream—you cut off that linkage between the forest and the stream."

Normally, he went on, "those insects are going to fly back into the woods as adults, and everybody in the woods is going to eat them. And that happens in April and May, at the same time you have the breeding birds coming back, the same time the turtles and toads are starting to breed.

PAUL CORBIT BROWN (2)

Shoveling 100 tons of earth at a time, 20-story-tall draglines (left: at the Hobet 21 mine) claw hundreds of feet through several seams before reaching the kind of coal that generates the most heat and, says truck driver and mine-union official Roger Horton (below), is favored by the steel industry.

Everything is coming back in around the stream because that's a tremendously valuable food source."

But a stream buried beneath a valley fill no longer supports such life, and the effects reverberate through the forest. A recent EPA study showed that mayflies—among the most fecund insects in the forest—had largely disappeared from waterways downstream from mountaintop mining sites. That might seem a small loss, but it's an early, critical break in the food chain that, sooner or later, will affect many other animals.

Mountaintop mining operations, ecologists say, fracture the natural spaces that enable dense webs of life to flourish, leaving smaller "islands" of unspoiled territory. Those become biologically impoverished as native plants and animals die and invasive species move in. In one study, EPA and U.S. Geological Survey scientists who analyzed satellite images of a 19-county area in West Virginia, eastern Kentucky and southwestern Virginia found that "edge" forests were replacing denser, greener "interior" forests far beyond the mountaintop mining-site borders, degrading ecosystems across a wider area than previously thought. Wildlife is in decline. For instance, cerulean warblers, migratory songbirds that favor Appalachian ridgelines for nesting sites, have dropped 82 percent over the past 40 years.

The mining industry maintains that former mining sites can be developed commercially. The law requires that the mining company restore the mountaintop's "approximate original contour" and that it revert to forestland or a "higher and better use." A company can get an exemption from the rebuilding requirement if it shows that a flattened mountain may generate that higher value.

Typically, mining companies bulldoze a site and plant it with a fast-growing Asian grass to prevent erosion. One former surface mine in West Virginia is now the site of a state prison; another is a golf course. But many reclaimed sites are now empty pasturelands. "Miners have claimed that returning forestland to hay land, wildlife habitat or grassland with a few woody shrubs on it was 'higher use,'" says Jim Burger, a professor of forestry at Virginia Tech. "But hay land and grassland is almost never used for that [economic] purpose, and even wildlife habitat has been abandoned."

Some coal companies do rebuild mountains and replant forests—a painstaking process that takes up to 15 years. Rocky Hackworth, the superintendent of the Four Mile Mine in Kanawha County, West Virginia, took me on a tour of rebuilding efforts he oversees. We climbed into his pickup truck and rolled across the site, past an active mine where half a hillside had been scooped out. Then the twist-

ing dirt road entered an area that was neither mine nor forest. Valley fills and new hilltops of crushed rock had been covered with topsoil or "topsoil substitute"—crushed shale that can support tree roots if loosely packed. Some slopes had grass and shrubs, others were thick with young sumacs, poplars, sugar maples, white pines and elms.

This type of reclamation requires a degree of stewardship many mine companies have not provided, and its long-term ecological impact isn't clear, especially given the stream disruptions caused by valley fills. And it still faces regulatory hurdles. "The old mind-set is, we've got to control erosion first," Hackworth said. "So that's why they want it walked real good, packed real good. You plant grass on it—which is better for controlling erosion, but it's worse for tree growth. It's a Catch-22."

Some landowners have made stabs at creating wildlife habitats at reclaimed sites with pools of water. "The small ponds are marketed to the regulatory agencies as wildlife habitat, and ducks and waterfowl do come in and use that water," said Orie Loucks, a retired professor of ecology at Miami University of Ohio who has studied the effects of mountaintop removal. "It's somewhat enriched in acids, and, of course, a lot of toxic metals go into solution in the presence of [such] water. So it's not clear the habitat is very healthy for wildlife and it's not clear many people go up on these plateau areas to hunt ducks in the fall."

"When it broke loose it come down, and my daughter lived at the mouth of it," Workman says. "The water was plumb up in her house."

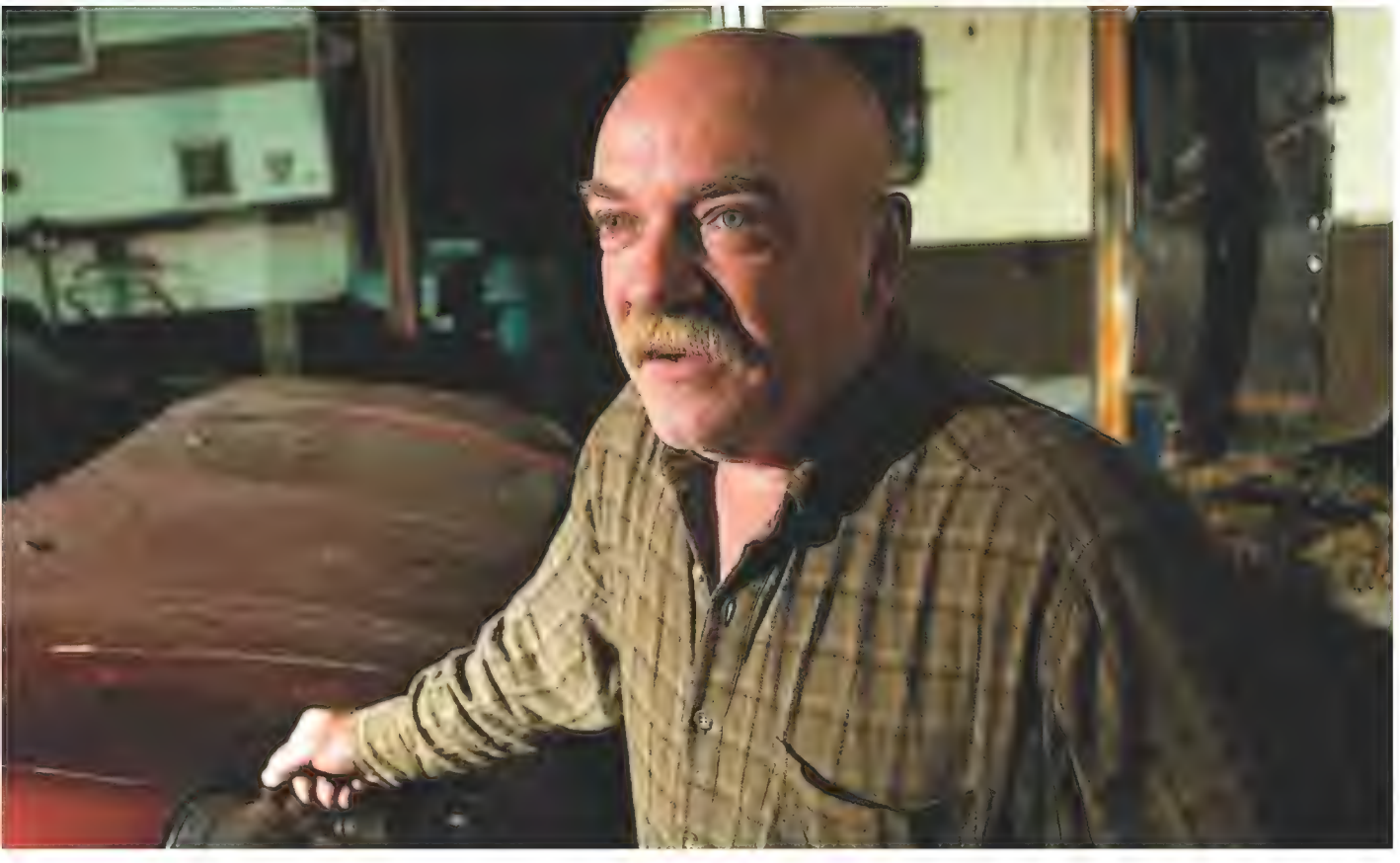
Mountaintop mining waste contains chemical compounds that otherwise remain sealed up in coal and rock. Rainwater falling on a valley fill becomes enriched with heavy metals such as lead, aluminum, chromium, manganese and selenium. Typically, coal companies construct filtration ponds to capture sediments and valley-fill runoff. But the water flowing out of these ponds isn't pristine, and some metals inevitably end up flowing downstream, contaminating water sources.

Mountaintop sites also create slurry ponds—artificial lakes that hold the byproducts of coal processing and that sometimes fail. In 2000, a slurry impoundment in Kentucky leaked into an underground mine and from there onto hillsides, where it enveloped yards and homes and spread into nearby creekbeds, killing fish and other aquatic life and contaminating drinking water. The EPA ranked the incident, involving more than 300 million gallons of coal slurry, one of the worst environmental disasters in the southeastern United States. After a months-long cleanup, federal and state agencies fined the impoundment owner, Martin County Coal, millions of dollars and ordered it to close and reclaim the site. Officials at the U.S. Mine Safety and Health Administration later conceded that their procedures for approving such sites had been lax.

Scientists and community groups are concerned about the possible effects of coal-removal byproducts and waste. Ben Stout, the biologist, says he has found barium and arsenic in slurry from sites in southwestern West Virginia at concentrations that nearly qualify as hazardous waste. U.S. Forest Service biologist A. Dennis Lemly found deformed fish larvae in southern West Virginia's Mud River—some specimens with two eyes on one side of their head. He blames the deformities on high concentrations of selenium from the nearby Hobet 21 mountaintop project. "The Mud River ecosystem is on the brink of a major toxic event," he wrote in a report filed in a court case against the mining site, which remains active.

Scientists say they have little data on the effects of mountaintop coal mining on public health. Michael Hendryx, a professor of public health at West Virginia University, and a colleague, Melissa Ahern of Washington State University, analyzed mortality rates near mining-industry sites in West Virginia, including underground, mountaintop and processing facilities. After adjusting for other factors, including poverty and occupational illness, they found statistically significant elevations in deaths for chronic lung, heart and kidney disease as well as lung and digestive-system cancers. Overall cancer mortality was also elevated. Hendryx stresses that the information is preliminary. "It doesn't prove that pollution from the mining industry is a cause of the elevated mortality," he says, but it appears to be a factor.

PP. 82-83 ANTRIM CASKEY; P. 83 WEST VIRGINIA DIVISION OF CULTURE AND HISTORY / AP IMAGES; ANTRIM CASKEY



In tradition-rich West Virginia (below: underground miners at Gauley Mountain in an undated photo), some former mineworkers (Twilight residents Mike Workman, bottom, pointing to dust on his truck, and Richard Lee White, left) oppose local mountaintop operations as overly destructive.

MOUNTAINTOP REMOVAL HAS DONE what no environmental group could ever do: it has succeeded in turning many local people, including former miners, against West Virginia's oldest industry. Take 80-year-old Jim Foster, a former underground miner and mine-site welder and a lifelong resident of Boone County, West Virginia. As a boy before World War II, he used to hike and camp in Mo's Hollow, a small mountain valley now filled with rubble and waste from a mountaintop removal site. Another wilderness area he frequented, a stream valley called Roach Branch, was designated in 2007 as a fill site. Foster joined a group of local residents and the Huntington, West Virginia-based Ohio Valley Environmental Coalition in a federal lawsuit to block the Roach Branch Valley fill site on the grounds that the environmental impacts hadn't been adequately assessed. They won the first round when Judge Robert Chambers issued a temporary restraining order against the valley fills. The coal company is appealing the decision.

Foster says he puts up with a daily barrage of irritations from nearby mountaintop removal projects: blasting, 22-wheeled coal trucks on the road and ubiquitous dust. As we talked in his living room, trucks carrying coal explosives rumbled by. "Practically every day, our house is shook by the violent tremors caused by these blasts," he said, gesturing from his easy chair. "The one up there—you can see it from my window here—I've watched it as they tore that down. Before they started on it, it was beautiful twin peaks there, it was absolutely beautiful. And to look out and see the destruction going on day to day like it has, and see that mountain disappear, each day more of it being gone—to me that really, really hurts."

Around mining sites, tensions run high. In Twilight, a Boone County hamlet situated among three mountaintop sites, Mike Workman and his next-door neighbor, another retired miner named Richard Lee White, say they have battled constantly with one nearby operation. Last year, trucks exiting the site tracked onto the road a mud slick that persisted for weeks and precipitated several accidents, including one in which Workman's 27-year-old daughter, Sabrina Ellsworth, skidded and totaled her car; she was shaken up but not injured. State law requires that mining operations have working truck washes to remove mud; this one did not. After Workman com-

plained repeatedly to state agencies, the state Department of Environmental Protection shut down the mine and fined its owner $13,482; the mine reopened two days later, with a working truck wash.

Workman also remembers when a coal slurry impoundment failed in 2001, sending water and sludge pouring through a hollow onto Route 26. "When it broke loose it come down, and my daughter lived at the mouth of it. The water was plumb up in her house past her windows, and I had to take a four-wheel-drive truck to get her and her kids. And my house down here, [the flood] destroyed it."

Ansted residents have had mixed success fighting a mining operation conducted by the Powellton Coal Company outside town. In 2008, they lost an appeal before West Virginia's Surface Mine Board, which rejected their argument that the blasting could flood homes by releasing water sealed in old mine shafts. But the year before, the town beat back an attempt to run big logging and coal trucks past a school and through town. "This is a residential area—this is not an industrial area," says Katheryne Hoffman, who lives at the edge of town. "We managed to get that temporarily stopped—but then they still got the [mining] permit, which means they will begin to bring the coal through somewhere, and it'll be the path of least resistance. Communities have to fight for their lives to get this stopped." A Powellton Coal Company official did not respond to requests for comment.

Critics (former mine-safety official Jack Spadaro at a West Virginia site) say that mountaintop projects routinely break laws that restrict dumping and pollution. For some Ansted residents, the question is whether Gauley Mountain (above) will succumb further to the draglines.

But many residents support the industry. "You have people who don't realize it is our livelihood here—it always has been, always will be," says Nancy Skaggs, who lives just outside Ansted. Her husband is a retired miner and her son does mine-site reclamation work. "Most of those against [mining] are people who have moved into this area. They don't appreciate what the coal industry does for this area. My husband's family has been here since before the Civil War, and always in the coal industry."

> "There is not a legal mountaintop mining operation in Appalachia. There literally is not one in full compliance with the law."

The dispute highlights the town's—and state's—predicament. West Virginia is the nation's third-poorest state, above only Mississippi and Arkansas in per capita income, and the poverty is concentrated in the coal fields: in Ansted's Fayette County, 20 percent of the population lives below the poverty line, compared with 16 percent in the state and 12 percent nationwide. For decades, mining has been the only industry in dozens of small West Virginia towns. But mountaintop coal removal, because of the toll it takes on the natural surroundings, is threatening the quality of life in communities that the coal industry helped build. And mountaintop removal, which employs half as many people to produce the same amount of coal as an underground mine, doesn't bring the same benefits that West Virginians once reaped from traditional coal mining.

The industry dismisses opponents' concerns as exaggerated. "What [environmentalists] are attempting to do is stir the emotions of people," says Bill Raney, president of the West Virginia Coal Association, "when the facts are that the disturbance is limited, and the type of mining is controlled by the geology."

WEST VIRGINIA'S POLITICAL establishment has been unwavering in its support for the coal industry. The close relationship is on display every year at the annual West Virginia Coal Symposium, where politicians and industry insiders mingle. This past year, Gov. Joe Manchin and Senator Jay Rockefeller

PAUL CORBIT BROWN (3)

addressed the gathering, advocating ways to turn climate-change legislation to the industry's advantage and reduce its regulatory burdens. "Government should be your ally, not your adversary," Manchin told coal-industry representatives.

Without such backing, mountaintop removal would not be possible, because federal environmental laws would prohibit it, says Jack Spadaro, a former federal mining regulator and a critic of the industry. "There is not a legal mountaintop mining operation in Appalachia," he says. "There literally is not one in full compliance with the law."

Industry representatives insist that mountaintop coal removal operations are conducted responsibly. West Virginia Coal Association president Bill Raney (right) says environmentalists who oppose the practice are merely attempting "to stir the emotions of people."

Since 1990, U.S. policy under the Clean Water Act has been "no net loss of wetlands." To "fill" a wetland, one needs a permit from the U.S. Army Corps of Engineers, which is supposed to evaluate the environmental effects and require mitigation by creating new wetlands elsewhere. If the potential impact is serious enough, the National Environmental Policy Act kicks in and a detailed study must be done. But the coal-mining industry has often obtained the necessary dumping permits without due consideration of possible environmental impacts.

The Corps has admitted as much in response to lawsuits. In one case, the Corps said it probably shouldn't even be overseeing such permits because the dumped waste contained polluting chemicals regulated by the EPA. In another case, brought by West Virginia environmental groups against four Massey Energy mining projects, the Corps conceded that it routinely grants dumping permits with virtually no independent study of the possible ecological fallout, relying instead on the assessments that coal companies submit. In a 2007 decision in that case, Judge Chambers found that "the Corps has failed to take a hard look at the destruction of headwater streams and failed to evaluate their destruction as an adverse impact on aquatic resources in conformity with its own regulations and policies." But because three of the mining projects challenged in that case were already underway, Chambers allowed them to continue, pending the case's resolution. Massey has appealed the case to the Virginia-based United States Court of Appeals for the Fourth Circuit, which has overturned several lower court rulings that went against mining interests.

In 2002, the Bush administration rewrote the rule defining mountaintop mining waste in an attempt to work around the legal ban on valley fills. This past October, the Interior Department, pending EPA approval, did away with regulations that ban dumping mine waste within 100 feet of a stream—a rule that's already routinely ignored (though the EPA recently fined Massey Energy $20 million for violations of the Clean Water Act).

Industry critics say they're also hampered by West Virginia regulations that protect private interests. The vast majority of West Virginia acreage is owned by private landholding companies that lease it and the mineral rights to coal companies. And while industrial land-use planning is a matter of public record in most states, not so in West Virginia. As a result, critics say, mountaintop projects unfold slowly bit by bit, making it hard for outsiders to grasp a project's scale until it's well underway.

In Ansted, residents say they can't even be sure what's coming next because the coal company doesn't explain its plans. "They will seek permits on small plots, 100- to 300-acre parcels," said Mayor Hobbs. "My sense is, we should have a right to look at that long-range plan for 20,000 acres. But if we got to see the full scope of those plans, then mountaintop removal would stop," because the enormousness of the affected areas would stoke opposition.

The standoff is frustrating to Hobbs, who has been unable to reconcile the coal industry's actions with his town's ambitions. "I'm a capitalist," he said. "I worked for a major corporation. I'm not against development. It's troubling—I see tourism and economic quality of life as the only thing that will last beyond a 15- to 20-year economic cycle. And with mountaintop removal, that is at risk. And even if we dodge that bullet, the next community may not."

PRESENCE OF MIND

Frost, Nixon and Me

How I discovered what is gained and lost when history is turned into entertainment

BY JAMES RESTON JR.

IN MAY 1976, IN A RATHER DIM New York City hotel room filled with David Frost's cigar smoke, the British television personality put an intriguing proposition to me: leave your leafy academic perch for a year and prepare me for what could be a historic interrogation of Richard Nixon about Watergate.

This would be the nation's only chance for no holds barred questioning of Nixon on the scandal that drove him to resign the presidency in 1974. Pardoned by his successor, Gerald Ford, Nixon could never be brought into the dock. Frost had secured the exclusive rights to interview him. Thus the prosecution of Richard Nixon would be left to a television interview by a foreigner.

A movie based on the Frost-Nixon talks (top: in 1977) opened last month. Sheen (left) and Langella starred in the 2006 play.

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I took the job.

The resulting Frost-Nixon interviews—one in particular—indeed proved historic. On May 4, 1977, forty-five million Americans watched Frost elicit a sorrowful admission from Nixon about his part in the scandal: "I let down my friends," the ex-president conceded. "I let down the country. I let down our system of government, and the dreams of all those young people that ought to get into government but now think it too corrupt. . . . I let the American people down, and I have to carry that burden with me the rest of my life."

If that interview made both political and broadcast history, it was all but forgotten two years ago, when the Nixon interviews were radically transformed into a piece of entertainment, first as the play *Frost/Nixon*, and now as a Hollywood film of the same title. For that televised interview in 1977, four hours of interrogation had been boiled down to 90 minutes. For the stage and screen, this history has been compressed a great deal more, into something resembling comedic tragedy. Having participated in the original event as Frost's Watergate researcher, and having had a ringside seat at its transformation, I've been thinking a lot lately about what is gained and what is lost when history is turned into entertainment.

I HAD ACCEPTED Frost's offer with some reservations. Nixon was a skilled lawyer who had denied Watergate complicity for two years. He had seethed in exile. For him, the Frost interviews were a chance to persuade the American people that he had been done an epic injustice—and to make upwards of $1 million for the privilege. And in David Frost, who had no discernible political philosophy and a reputation as a soft-soap interviewer, Nixon seemed to have found the perfect instrument for his rehabilitation.

Although Nixon's active role in the coverup had been documented in a succession of official forums, the absence of a judicial prosecution had left the country with a feeling of unfinished business. To hear Nixon admit to high crimes and misdemeanors could provide a national catharsis, a closing of the books on a depressing episode of American history.

For all my reservations, I took on the assignment with gusto. I had worked on the first Watergate book to advocate impeachment. I had taken a year off from teaching creative writing at the University of North Carolina to witness the Ervin Committee hearings of 1973, from which most Americans' understanding of Watergate came, because I regarded the scandal as the greatest political drama of our time. My passion lay in my opposition to the Vietnam War, which I felt Nixon had needlessly prolonged for six bloody years; in my sympathy for Vietnam War resisters, who had been pilloried by the Nixonians; and in my horror over Watergate itself. But I was also driven by my desire for engagement and, I like to think, a novelist's sense of the dramatic.

To master the canon of Watergate was a daunting task, for the volumes of evidence from the Senate, the House and various courts would fill a small closet. Over many months I combed through the archives, and I came across new evidence of Nixon's collusion with his aide Charles Colson in the coverup—evidence that I was certain would surprise Nixon and perhaps jar him out of his studied defenses. But mastering the record was only the beginning. There had to be a strategy for compressing two years of history into 90 minutes of television. To this end, I wrote a 96-page interrogation strategy memo for Frost.

In the broadcast, the interviewer's victory seemed quick, and Nixon's admission seemed to come seamlessly. In reality, it was painfully extracted from a slow, grinding process over two days.

At my suggestion, Frost posed his questions with an assumption of guilt. When Nixon was taken by surprise—as he clearly was by the new material—you could almost see the wheels turning in his head and almost hear him asking himself what else his interrogator had up his sleeve. At the climactic moment, Frost, a natural performer, knew to change his role from inquisitor to con-

In the broadcast, his admission seemed to come seamlessly. In reality, it was painfully extracted over two days.

The author (right: with Nixon in 1977) guided Frost's questioning on Watergate.

fessor, to back off and allow Nixon's contrition to pour out.

In Aristotelian tragedy, the protagonist's suffering must have a larger meaning, and the result of it must be enlightenment. Nixon's performance fell short of that classical standard—he had been forced into his admission, and after he delivered it, he quickly reverted to blaming others for his transgressions. (His reversion to character was cut from the final broadcast.) With no lasting epiphany, Nixon would remain a sad, less-than-tragic, ambiguous figure.

FOR ME, THE TRANSITION from history to theater began with a letter from Peter Morgan, the acclaimed British screenwriter (*The Queen*), announcing his intention to write a play about the Frost-Nixon interviews. Since I loved the theater (and have written plays myself), I was happy to help in what seemed then a precious little enterprise.

At lunches in London and Washington, I spilled out my memories. And then I remembered that I had written a narrative of my involvement with Frost and Nixon, highlighting various tensions in the Frost camp and criticizing the interviewer for failing, until the end, to apply himself to his historic duty. Out of deference to Frost, I hadn't published it. My manuscript had lain forgotten in my files for 30 years. With scarcely a glance at it, I fished it out and sent it to Morgan.

In the succeeding months I answered his occasional inquiry without giving the matter much thought. I sent Morgan transcripts of the conversations between Nixon and Colson that I had uncovered for Frost. About a year after first hearing from Morgan, I learned that the play was finished and would première at the 250-seat Donmar Warehouse Theatre in London with Frank Langella in the role of Nixon. Morgan asked if I would be willing to come over for a couple of days to talk to Langella and the other actors. I said I'd love to.

On the flight to London I reread my 1977 manuscript and I read the play, which had been fashioned as a bout between fading heavyweights, each of whose careers were on the wane, each trying to use the other for resurrection. The concept was theatrically brilliant, I thought, as well as entirely accurate. A major strand was the rising frustration of a character called Jim Reston at the slackness of a globe-trotting gadfly called David Frost. Into this Reston character was poured all the anger of the American people over Watergate; it was he who would prod the Frost character to be unrelenting in seeking the conviction of Richard Nixon. The play was a slick piece of work, full of laughs and clever touches.

For the play's first reading we sat round a simple table at the Old Vic, ten actors (including three Americans), Morgan, me and the director, Michael Grandage. "Now we're going to go around the table, and everyone is going to tell me, 'What was Watergate?'" Grandage began. A look of terror crossed the actors' faces, and it fell to me to explain what Watergate was and why it mattered.

The play, in two acts, was full of mar-

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velous moments. Nixon had been humanized just enough, a delicate balance. To my amusement, Jim Reston was played by a handsome 6-foot-2 triathlete and Shakespearean actor named Elliot Cowan. The play's climax—the breaking of Nixon—had been reduced to about seven minutes and used only a few sentences from my Colson material. When the reading was over, Morgan turned to Grandage. "We can't do this in two acts," he said. The emotional capital built up in Act I would be squandered when theatergoers repaired to the lobby for refreshments and cellphone calls at intermission. Grandage agreed.

I knew not to argue with the playwright in front of the actors. But when Morgan and I retreated to a restaurant for lunch, I insisted that the breaking of Nixon happened too quickly. There was no grinding down; his admission was not "earned." I pleaded for the inquisition to be protracted, lengthened, with more of the devastating Colson material put back in.

Morgan resisted. This was theater, not history. He was the dramatist; he knew what he was doing. He was focused on cutting, not adding, lines.

Back at the theater, after a second reading, Langella took up my argument on his own. Nixon's quick collapse did not feel "emotionally right" to him, he said. He needed more lines. He needed to suffer more. Grandage listened for a while, but the actor's job was not to question the text, but to make the playwright's words work. The play would stay as written.

It opened in London on August 10, 2006, to terrific reviews. The critics raved about Langella's performance as Nixon, as well as Michael Sheen's as David Frost. (I tried not to take it personally when the *International Herald Tribune* critic, Matt Wolf, wrote, "*Frost/Nixon* provide[s] a snarky guide to [the] proceedings in the form of Elliot Cowan's bespectacled James Reston, Jr.") No one seemed to care about what was historically accurate and what had been made up. No one seemed to find Nixon's breaking down and subsequent contrition unsatisfy-

I knew not to argue with the playwright in front of the actors. But in private I pled for the inquisition to be protracted.

The film *Frost/Nixon* (Langella and Sheen reprising their roles) obeys cinematic laws.

ing. Not even me. Langella had made it work, brilliantly . . . not through more words, but with shifting eyes, awkward pauses and strange, uncomfortable body language, suggesting a squirming, guilty man. Less had become more as a great actor was forced back on the essential tools of his art.

Langella had not impersonated Nixon, but had become a totally original character, inspired by Nixon perhaps, but different from him. Accuracy—at least within the walls of theater—did not seem to matter. Langella's performance evoked, in Aristotelian terms, both pity and fear. No uncertainty lingered about the hero's (or the audience's) epiphany.

IN APRIL 2007 the play moved to Broadway. Again the critics raved. But deep in his admiring review, the *New York Times'* Ben Brantley noted, "Mr. Morgan has blithely rejiggered and rearranged facts and chronology" and referred readers to my 1977 manuscript, which had just been published, at last, as *The Conviction of Richard Nixon*. A few days later, I heard from Morgan. Brantley's emphasis on the play's factual alterations was not helpful, he said.

Morgan and I had long disagreed on this issue of artistic license. I regarded it as a legitimate point between two people coming from different value systems. Beyond their historical worth, the 1977 Nixon interviews had been searing psychodrama, made all the more so by the uncertainty over their outcome—and the ambiguity that lingered. I did not think they needed much improving. If they were to be compressed, I thought they should reflect an accurate essence.

Morgan's attention was on capturing and keeping his audience. Every line needed to connect to the next, with no lulls or droops in deference to dilatory historical detail. Rearranging facts or lines or chronology was, in his view, well within the playwright's mandate. In his research for the play, different participants had given different, *Rashômon*-like versions of the same event.

"Having met most of the participants and interviewed them at length," Morgan wrote in the London program for the play, "I'm satisfied no one will ever agree on a single, 'true' version of what happened in the Frost/Nixon interviews—thirty years on we are left with many truths or many fictions depending on your point of view. As an author, perhaps inevitably that appeals to me, to think of history as a creation, or several creations, and in the spirit of it all I have, on occasion, been unable to resist using my imagination."

In a *New York Times* article published this past November, Morgan was unabashed about distorting facts. "Whose facts?" he told the *Times* reporter. Hearing different versions of the same events, he said, had taught him "what a complete farce history is."

I emphatically disagreed. No legitimate historian can accept history as a creation in which fact and fiction are equals. Years later participants in historical events may not agree on "a single, 'true' version of what happened," but it's the historian's responsibility to sort out who is telling the truth and who is covering up

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or merely forgetful. As far as I was concerned, there was one true account of the Frost/Nixon interviews—my own. The dramatist's role is different, I concede, but in historical plays, the author is on the firmest ground when he does not change known facts but goes beyond them to speculate on the emotional makeup of the historical players.

But this was not my play. I was merely a resource; my role was narrow and peripheral. *Frost/Nixon*—both the play and the movie—transcends history. Perhaps it is not even history at all: in Hollywood, the prevailing view is that a "history lesson" is the kiss of commercial death. In reaching for an international audience, one that includes millions unversed in recent American history, Morgan and Ron Howard, the film's director, make the history virtually irrelevant.

In the end it is not about Nixon or Watergate at all. It's about human behavior, and it rises upon such transcendent themes as guilt and innocence, resistance and enlightenment, confession and redemption. These are themes that straight history can rarely crystallize. In the presence of the playwright's achievement, the historian—or a participant—can only stand in the wings and applaud.

JAMES RESTON JR. *is the author of* The Conviction of Richard Nixon *and 12 other books.*

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Scientists studying the universe have concluded that its basic properties are uncannily suited for life. They say, "There are so many life friendly properties that physicists cannot dismiss them as mere accidents. Tweak the laws of physics in just about any way—in this universe anyway—and life as we know it would not exist—nor would we."

Richard W. Wetherill
1906-1989

After reading that paragraph, ask yourself how are people treating our amazingly fine-tuned habitat? Answers might vary, but most would agree that it is often misused to serve human purposes.

This essay intends to draw people's attention to their nonconformance to a little- known law of nature, causing them untold physical, mental, and/or emotional misery as well as any disregard for the safety of planet Earth.

Early in the past century Richard W. Wetherill identified that natural law and presented it in a book entitled, *Tower of Babel*, published and on sale in January 1952. Its correction technique was copied by psychologists in the Philadelphia area, but the book's reference to a natural law of behavior was ignored.

Wetherill's epiphanies and a study of his behavior and that of many thousand others had revealed people's wrong attitude toward the realities of life. After eons of human efforts to quiet turbulent human affairs, they still cry out for solutions.

If we reason from the fact that this planet is the only place in the universe that supports life as we know it, Wetherill suggests the following:

Whoever or whatever created this perfectly constructed planet also created a law governing its inhabitant's behavior. Wetherill called it the ***law of absolute right: Right action gets right results***. It defines right as what is truly logical, rational, and honest. As with creation's laws of physics, only by conforming to this behavioral law do people solve their problems and avoid further trouble.

It is well known that not conforming to natural laws results in trouble of one kind or another. By failing to take right action, people unwarily invite myriad problems and trouble that, sooner or later, cause each person's death. No argument here; death is what has been happening from the beginning of human life to the present generation.

No claims are being made. We are presenting facts that can be verified by anybody observing the cause-and-effect sequence of human existence.

We think that this perfectly constructed universe calls for perfectly behaving occupants and that that result can be achieved when enough persons do their best to conform to nature's behavioral law mentioned earlier.

Wetherill often spoke of the need for a microcosm of a rational society to display right results for others to observe. The adult population of the United States of America could be that microcosm in our world population of over seven billion. Don't hesitate! The persons who are conforming to nature's law of behavior are enjoying the right results that the law promises.

No instructions were given ancient peoples regarding a law of gravitation, but they learned to conform to it to stay out of trouble with the force of gravity. Please regard this public-service message as a wake-up call for readers to adapt their behavior to conform to nature's law of absolute right. Be assured, people's truly rational, honest behavior extends the beneficent intent of whoever or whatever created this life-friendly universe and us.

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BY RICHARD CONNIFF

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Not to worry. I was just savoring the idea that the American landscape is littered with halls of fame that frequently lack the hall, and also, well, the fame. They honor achievement in fields where ticker-tape parades and groupies are not generally part of the deal structure. Dairy farming, for instance.

So the Agricultural Hall of Fame, in Bonner Springs, Kansas, does right by the likes of Carl Gustav Patrick DeLaval, inventor of the DeLaval high-speed centrifugal cream separator. And if you think this nation does not owe a profound debt of gratitude to Mr. DeLaval, ask yourself: If we couldn't separate the cream, how would we whip it? And if we couldn't whip it, where would strawberry shortcake be?

Some halls of fame are admittedly just a nice way for industries to give loyal timeservers a pat on the back. The California Pharmacy Hall of Fame, for instance, recently inducted one pill-trade titan for working "tirelessly to keep pharmacy in high regard with policymakers." Translation: He's a lobbyist. There's also an Insurance Hall of Fame, but they lost me with the sentence on their Web site beginning, "What binds these Laureates together is. . . . " Could it be their genius at writing the artful nonrenewal notice? I'll never know. My list of 1,000 things to do before I die also does not include a visit to the Alabama Road Builders Hall of Fame (though an exhibition on chain gangs might just change my mind).

I'm more interested in halls of fame where there is an element of hapless love in play. The American Yo-Yo Association Hall of Fame in Chico, California, for instance, celebrates heroes like Gus Somera, who "made himself a legend as a yo-yo demonstrator. . . . " The National Fresh Water Fishing Hall of Fame and Museum in Hayward, Wisconsin, includes a "Shrine to Anglers" in the form of a 143-foot-long, four-and-a-half-story-tall "hand-sculpted" likeness of a leaping muskellunge. That's a kind of fish, and there's an observation platform in its gaping mouth where 20 people at a time can stand behind the spiky teeth and imagine what it might be like for a fishing lure to come whizzing out of the sky and whisk them off into eternity.

The idea is clearly to attract tourists, and location matters. The New York-based National Soccer Hall of Fame and Museum asks "Why Oneonta?" on its Web site. And the National Distance Running Hall of Fame asks "Why Utica?" Neither comes out and says: "Hey, aren't we at least worth a side trip from the Baseball Hall of Fame in Cooperstown?"

All this suggests that, with a little marketing savvy, the possibilities for celebrating the unfamous are limitless. Why not, for instance, a High School Principals' Hall of Fame, celebrating achievement with the raised eyebrow and lowered expectations? Or how about a Fast Food Workers' Hall of Fame? (Did you know Eileen Edwards used to work at McDonald's before she got a makeover and became Shania Twain?) Think big. How about a Breathing In and Breathing Out Hall of Fame? The good news: Congratulations! You're one of our laureates.

The bad news: Your membership expires when you do.

RICHARD CONNIFF's *selection to the Richard Conniff Hall of Fame is currently pending.*

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